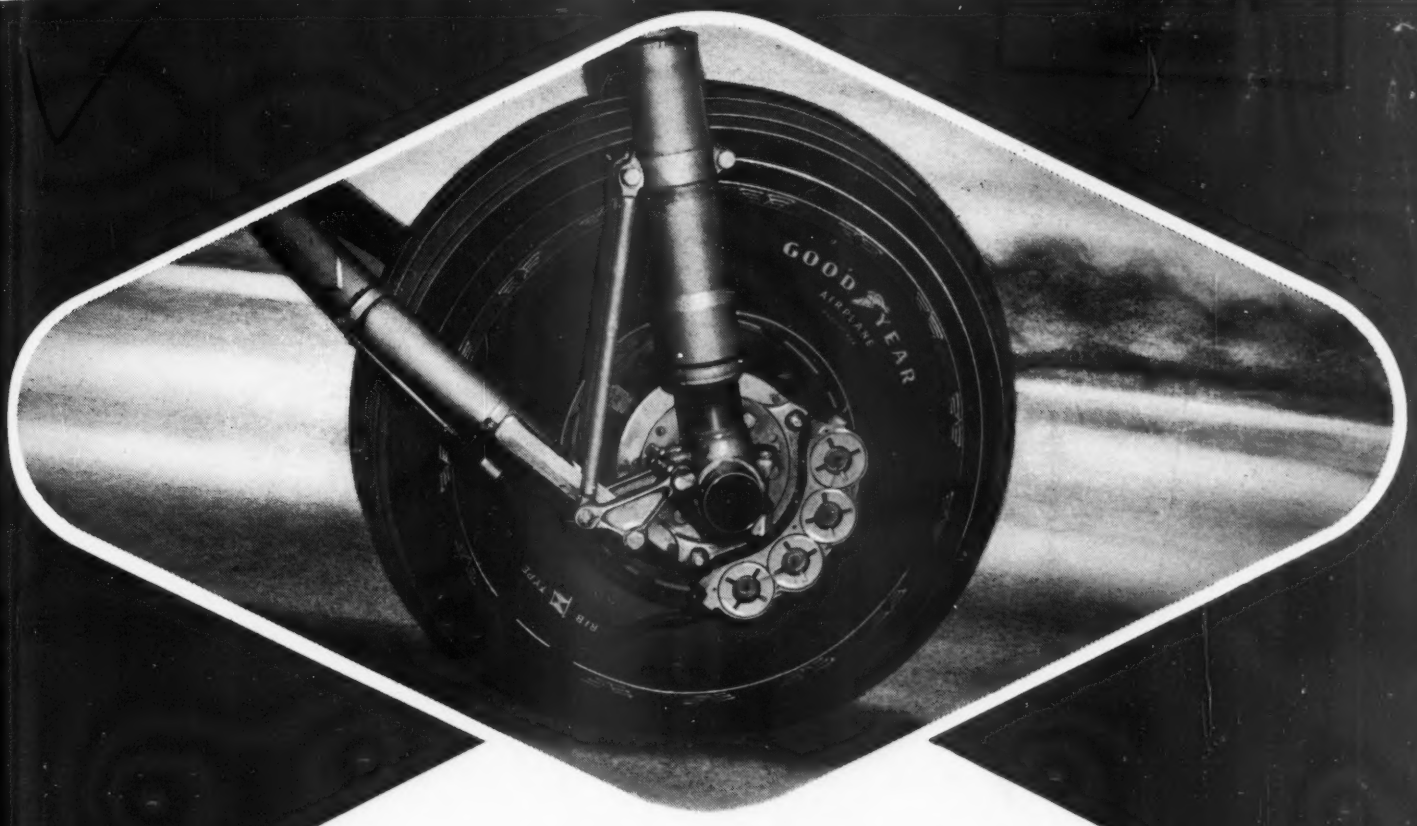
AVIATION WEEK
A McGRAW-HILL PUBLICATION
DEC. 13, 1948



Now a lighter, stronger brake for DC-3's

Goodyear announces a new brake for DC-3's —the Dual Disc Brake. It's more than 75 pounds lighter per plane and is rated at 2,000,000 foot-pounds of kinetic energy. The Dual Disc Brake has the same self-aligning mechanism as the famous Goodyear Single Disc Brake, permits visual check of lining wear before each flight. Delta is one of the airlines which has already changed over completely to Dual Disc. Inquire about installing this new lighter, stronger brake on your DC-3's. Write: Goodyear Aviation Products Division, Akron 16, Ohio or Los Angeles 54, California.

1898 GOODYEAR 50 ANNIVERSARY 1948

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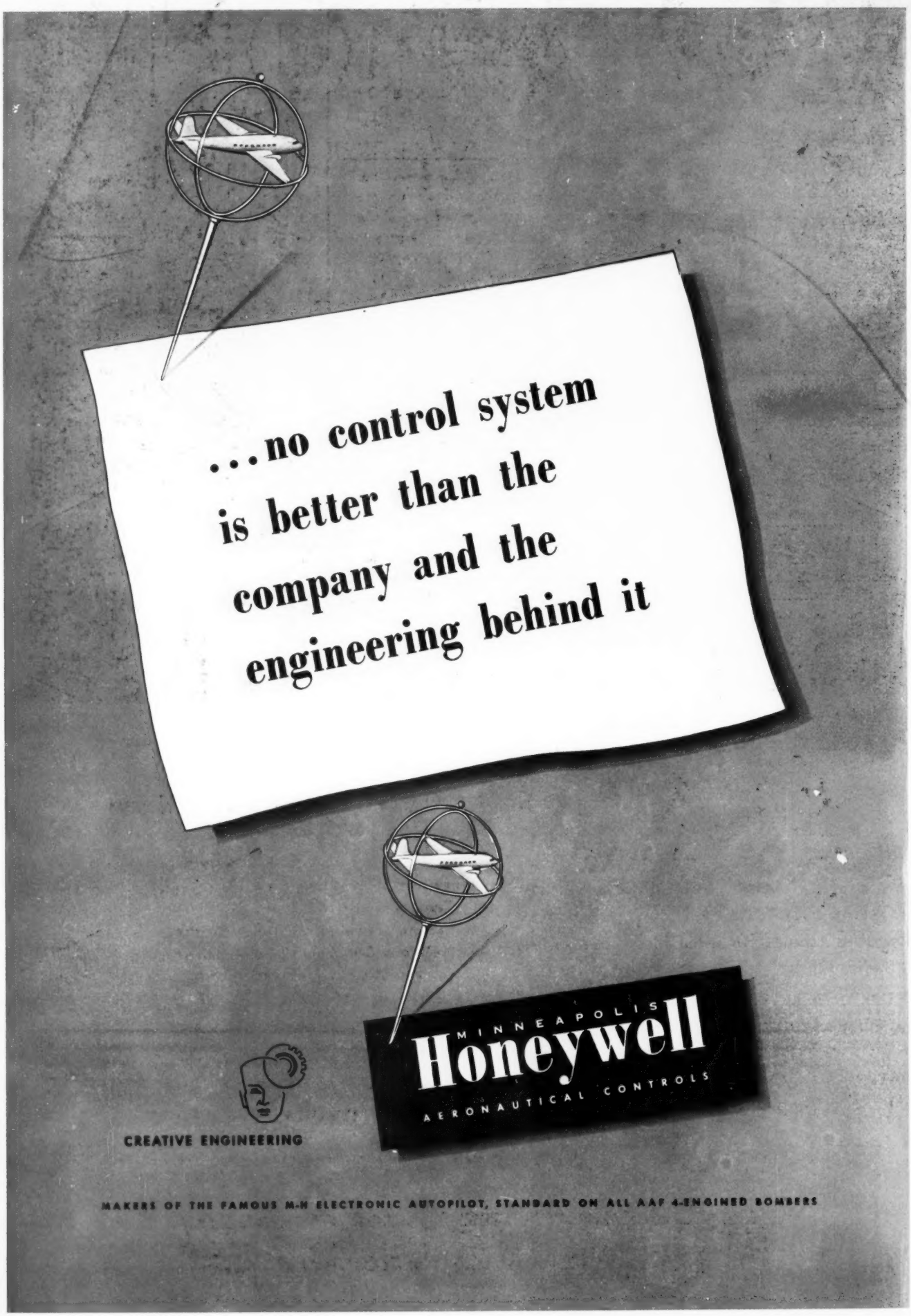
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MAKERS OF THE FAMOUS M-H ELECTRONIC AUTOPILOT, STANDARD ON ALL AAF 4-ENGINED BOMBERS

Faithful as a following shadow

The Kollsman Synchrotel Transmitter, incorporating a novel a.c. synchro, is the brain which directs the muscles into action for precise remote control as a function of Altitude, Air Speed, Mach Number, Vertical Speed, and Acceleration. The synchro used is the Synchrotel having jewel bearings, no brushes, and a lightweight rotor permitting smooth velvety action and immediate response like a following shadow. The Synchrotel may function as a control transformer, an inductive pick-off, resolver or signal generator.

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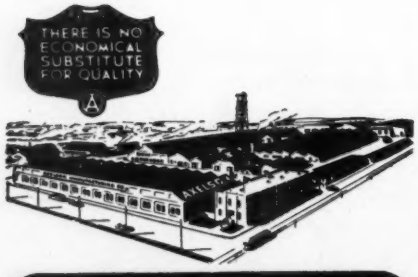
Axelson is currently producing superchargers for cabin pressurization of the Douglas DC-6 airplane. Numerous Axelson experimental projects are under way, in design stage, production stage and on actual operating tests. Axelson engineering maintains constant research to provide more efficient equipment, combining economy with finest quality.



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AIRCRAFT DIVISION

6160 South Boyle Ave.
Los Angeles 11, Cal.

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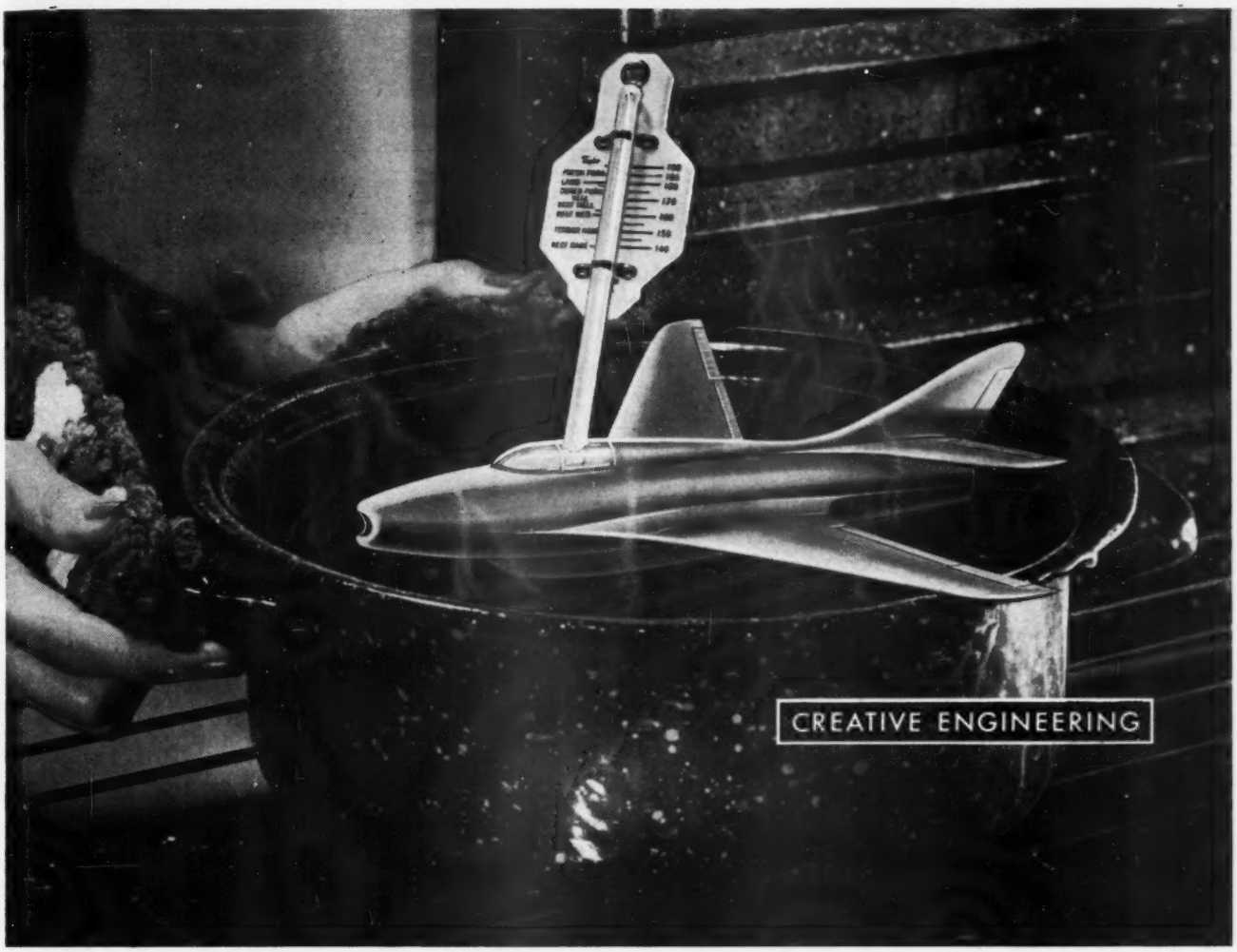

Just plane ROASTED...*unless!*

Pilots flying the new super jets would be "done to a turn" by terrific cabin heat *if it were not for highly specialized cabin cooling devices perfected by AiResearch.*

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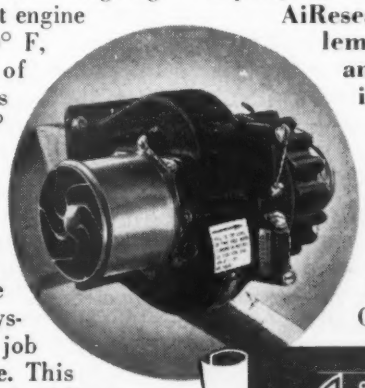

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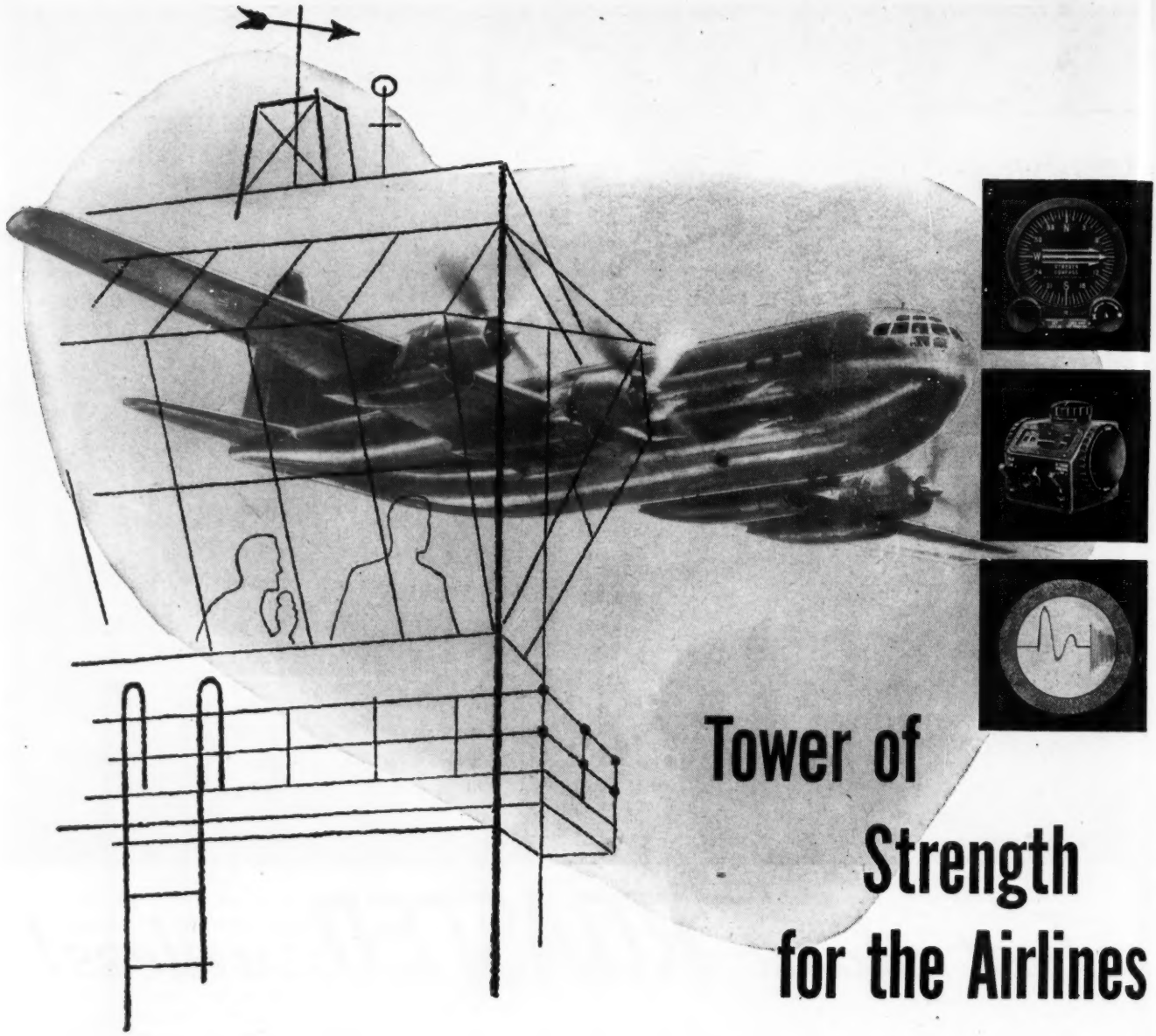

Tower of Strength for the Airlines

The strength of the commercial airlines lies in their ability to provide passengers with swift, pleasant and reliable air transportation. Helping the airlines in this are the C. A. A. Traffic Control Towers on hundreds of airfields across the country.

Strict radio control of all air traffic into and out of a field is essential, particularly when large numbers of aircraft are involved. Constant Tower communication with all incoming flights permits orderly and systematic arrivals and departures with the minimum of delay.

To speed and simplify landings in all kinds of weather, Sperry has available the most modern flight equipment . . . the A-12 Gyropilot* and its accessory, Automatic Approach Control. Using signals from the Localizer and Glide Path of an Instrument Landing System, Automatic Approach Control, operating through the A-12 Gyropilot, guides the airplane along the path defined by the ILS to within 60 feet of the runway, where the human pilot takes over.

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*TRADEMARK REG. U. S. PAT. OFF.

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Aviation and Foreign Aid

Several foreign aviation missions are now in the United States viewing our wares. Western Europe desperately needs a swift build up of its defensive air power. From these facts some observers have concluded that a new flood of foreign orders reminiscent of 1939-40 are in the offing. There are a number of reasons why such a repetition of aviation history should not be anticipated.

The aviation industry has the capacity to handle a greatly increased export demand and it certainly would welcome any new business. However, straight export sales of military types to western European nations are not in prospect. The reason is simple. In 1939-40 Europe was going broke. In 1948 Europe is broke. The western European nations are now dependent on the United States for sufficient food to keep alive. Their dollar-bare treasuries cannot finance the shiny new jet fighters they want to prevent a repetition of the paralyzing air assault from the east they suffered in 1940.

Lend-Lease Hope

Their only hope of getting enough defensive air armament soon enough seems to lie in a new lend-lease type program in which the United States will again underwrite at least part of their military investment. It is certain that some form of military aid program for western Europe will be presented to the 81st Congress next year. There seems little chance that aviation will loom large in whatever program finally goes to Congress.

To understand why U. S. aviation will probably play a minor initial role in the opening phases of a military aid program for Europe it is necessary to go back to the origins of the North Atlantic Defense Pact now under discussion by U. S. government top policy groups. Preliminary explorations on the Marshall Plan early this year indicated that economic rehabilitation would not be possible without a corresponding agreement on mutual defense.

Wanted Defense Pacts

Until a military pact was forthcoming no country was willing to depend on its neighbors for vital war industry or strategic raw materials. The western European nations looked to the United States for some definite indication that we would back up our economic aid with something more in event of emergency and that in any event we would not pull out of Europe if and when the cold war warmed up. That indication was given in the little-noted resolution sponsored by Senator Vandenberg that slipped through the Senate by a 66-4 vote last spring. It stated that the United States looked with favor on formation of a North Atlantic Regional Defense Pact. The earlier hemispheric defense pact at Rio was the precedent for this action. The Berlin airlift offered further proof that we intended to stay in Europe. Then with the nod from the United States the Benelux nations (Belgium, Luxembourg and Holland) plus France and Great Britain joined in the Brussels defense pact and organized an international general staff to conduct joint defense planning for the western European union. United States officers have been sitting in on these joint defense planning sessions in anticipation of the pact's enlargement to include the United States and Canada. Initial planning established the general roles of each nation in the common defense plan with the continental countries charged primarily with providing ground forces and Britain tagged to produce defensive air power. The United States role was tentatively assigned as provider of the reserve power to back up European ground and air if a conflict threatens.

Requirements Drawn

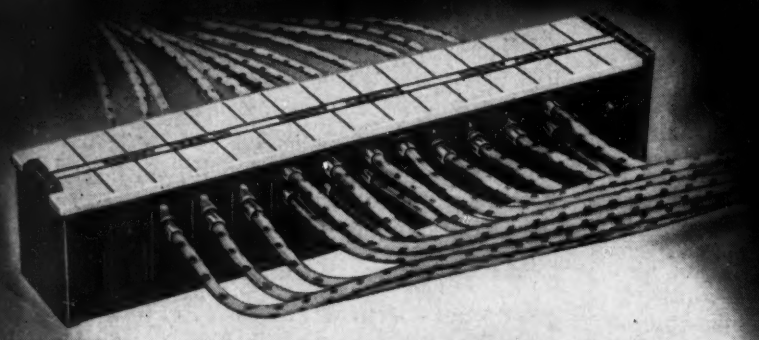
Planning has now reached the stage where specific requirements are being drawn up to fill western European needs. Here, as in the original ECA planning, there will be a wide gap between what Europe wants and what the United States can give. Pentagon planners would like to provide at least the initial European military aid largely out of war surplus stocks. This would be satisfactory for the ground forces but less so for the air. The Europeans want jet fighters to defend their population centers against another air blitz. The U. S. Air Force, already embroiled in its own expansion from a post-war low, has no jets to spare and would like to export part of its stock of pickled piston engine fighters.

At present Britain is supplying western Europe and Scandinavia with jet fighters of her second best type—the Vampire. But a full scale equipping of the western European union air forces with jet fighters would tax British production facilities beyond their present limits.

Guestimates of what the military aid program will add to the next national defense budget range around a billion dollars a year. Bulk of that will be war surplus equipment for European ground troops. If there is any air equipment involved it will be the unpickled Mustangs and Thunderbolts—not jet Shooting Stars and Thunderjets. Some observers feel that the piston fighters will be useful for a few more years in Europe since there is no real indication of large Russian and/or Russo-German jet plane production and the bulk of the Red Air Force is still World War II tactical types.

So the U. S. aircraft industry can expect no strong stimulus from whatever military aid goes to Europe in the near future. It will continue to depend almost entirely on the military production required by the expansion of the U. S. Air Force and the Naval air service for its substance. Western Europe will continue to re-arm largely with British Vampires and later Meteors. Only a sudden darkening of the European skies would materially alter this current planning.

NEW- fast-action terminal block-



BURNDY CRABLOK

View showing a double tier, spring loaded Socket Connector removed from assembly.

Contact Tips are easily attached by slipping over conductor end and indenting permanently in place with simple tool.

Connections can be "locked" when desired by simply tightening the Socket Connector screw.

Modernize your present terminal block assembly practice by using the new Burndy Crablok. It will simplify and speed up terminating and testing procedures. Crablok provides quick, positive, plug-in connections and quick disconnections. Double as well as single tier, spring loaded sockets, permit more connections in a smaller space. Sockets can be securely locked with an ordinary screwdriver. Assemblies are supplied in 3, 5, and 15 channel lengths with sockets to accommodate conductors from #22 to #8 AWG as well as 19/22 control wire. For circuit identification, an insulating one-way-fit plastic marking cover snaps onto the Crablok. Complete engineering cooperation is offered.

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AVIATION CALENDAR

Dec. 14-15—Aircraft Industries Assn., Air Force-Navy-Industry meeting on accessory drive requirements, Power Plant Lab., Wright-Patterson Air Force Base, Dayton, Ohio.

Dec. 17—Annual Wright Brothers Lecture, Institute of the Aeronautical Sciences, U. S. Chamber of Commerce Bldg., Washington, D. C.

Dec. 19-20—Statewide Operators Meeting, Minnesota Department of Aeronautics.

Dec. 21-22—University Farm Short Course for Dusters and Sprayers, Minnesota Department of Aeronautics.

Jan. 5, 1949—Florida Flying Alligator Club, 14th annual reunion, Melbourne, Fla.

Jan. 10-14—Materials Handling Show, sponsored by the American Society of Mechanical Engineers, Convention Hall, Phila.

Jan. 10-14—Society of Automotive Engineers, Annual Meeting and Engineering Display, Hotel Book-Cadillac, Detroit, Mich.

Jan. 11—ICAO Communications division, Montreal.

Jan. 12-14—Commercial Spray Operators conference, University of Illinois, Urbana, Ill.

Jan. 13-14—Fourth NAS Council meeting, AIA offices, Hollywood, Calif.

Jan. 18-Feb. 11—Third Air Transportation Institute, American University, Washington, D. C.

Jan. 24—Honors Night dinner, Institute of the Aeronautical Sciences, Hotel Astor, New York City.

Jan. 24-27—IAS seventeenth annual meeting, Hotel Astor, New York City.

Jan. 27—Society of Automotive Engineers, metropolitan section, fuels and lubricants meeting, Engineering Societies Bldg., New York City.

Feb. 8—ICAO Operations division, Montreal.

Feb. 22—ICAO Airworthiness division, Montreal.

Mar. 3—Society of Automotive Engineers, metropolitan section, air transport meeting, Engineering Societies Bldg., New York City.

Apr. 3-6—American Association of Airport Executives, Oklahoma City.

Apr. 11-13—Society of Automotive Engineers national aeronautic and air transport meeting, Hotel New Yorker, New York.

Apr. 11-16—Western Metal Congress and Exposition, sponsored by American Society for Metals, Shrine Civic Auditorium, Los Angeles, Calif.

July 3-4—First Annual Southern California International Air Race, Long Beach.

July 13—ICAO North Pacific regional air navigation meeting, Seattle.

Aug. 24—ICAO African-Indian ocean air navigation meeting, Algiers.

Aug. 29—Federation Aeronautique Internationale, Cleveland.

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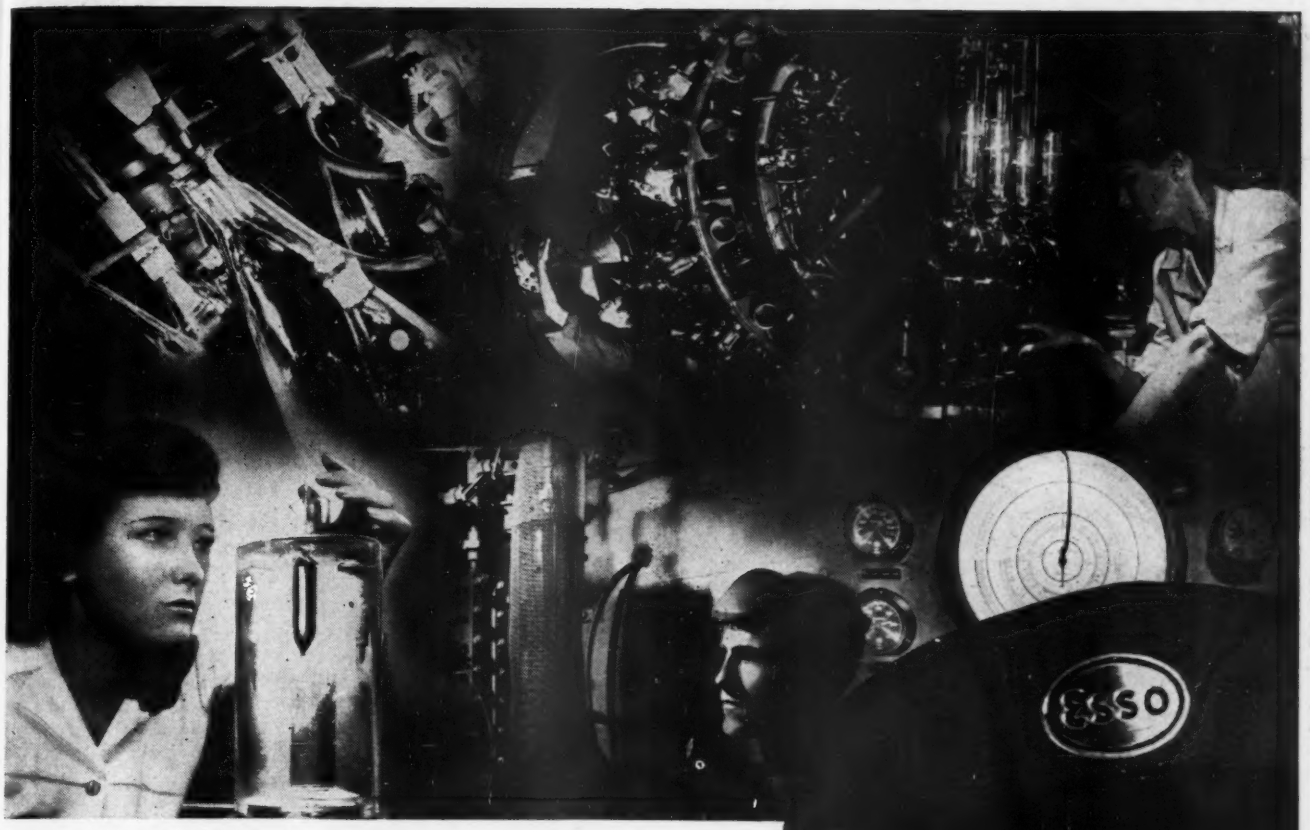
Acme—16, 17 (bottom); Bell Aircraft—15 (left); British Combine—25; CAA—12; Consolidated Vultee—21; Harris & Ewing—26; INP—15 (right); NACA—13, 15 (center); Press Assn.—17 (upper left); Smithsonian Institution—17 (middle left); TWA—47; UAL—49; Wide World—14.



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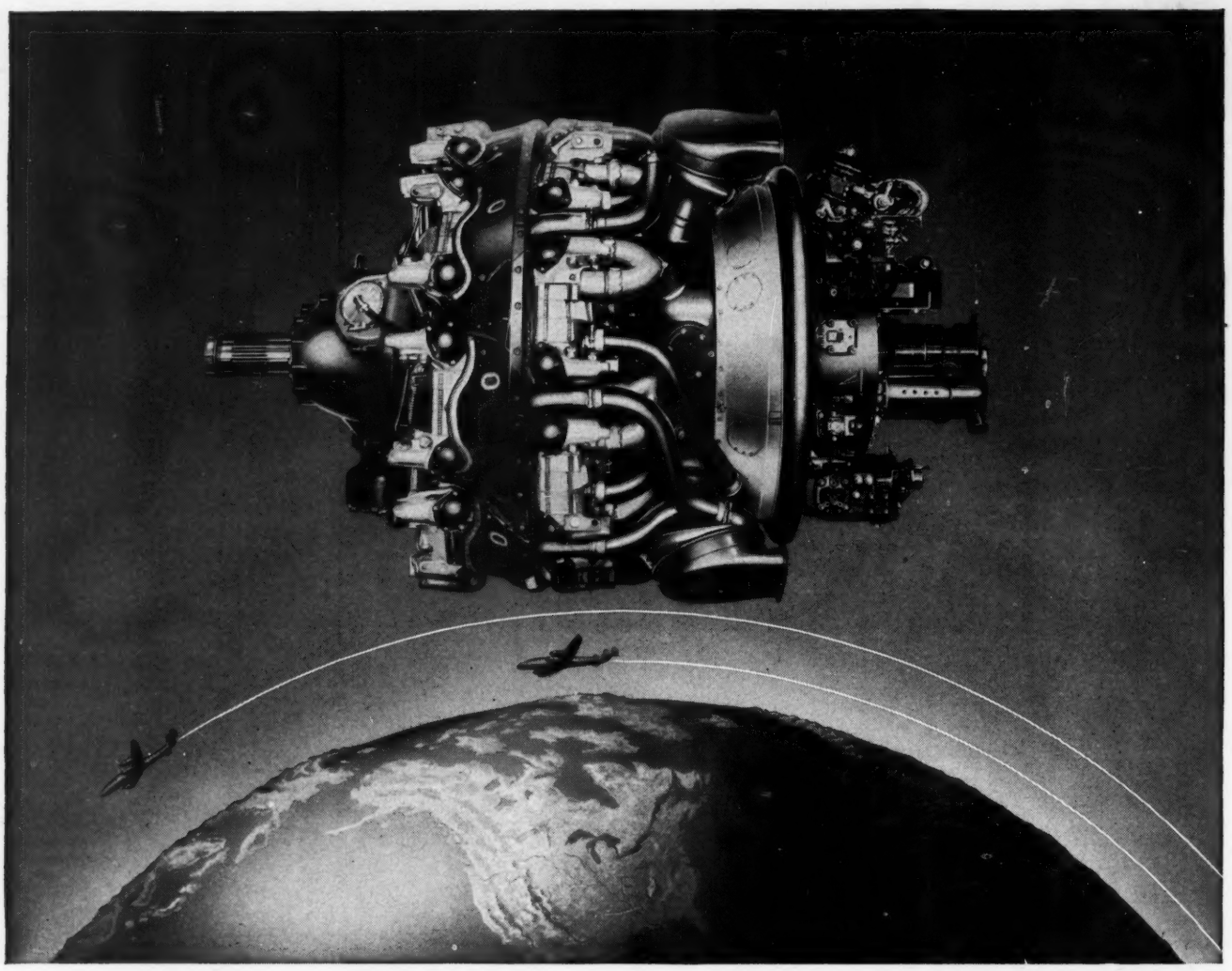

ANNOUNCING THE NEW *Turbo-Cyclone 18* COMPOUND ENGINE

Longer range, increased payload, greater economy and higher power output are provided by this latest Wright Aeronautical Corporation development.

▶ The Turbo-Cyclone 18 combines the dependable performance of the reciprocating engine with the simplicity and compactness of the gas turbine. It utilizes a sizable portion of the energy in the exhaust gases of a reciprocating engine to drive three turbines that are geared back to the engine crankshaft.

▶ To the operator the Turbo-Cyclone 18 offers a choice of (1) a reduction in specific fuel consumption of as much as 20%, (2) a 20% increase in range on the same amount of fuel, (3) a substantial increase in payload because of the reduced fuel consumption, or (4) a 20% increase in power for the same amount of fuel. Additional bonuses include . . .

▶ . . . *lower specific weight*—less than one pound per horsepower developed . . . *ease of installation in existing aircraft*—fits within cowl lines of existing nacelle . . . *ease of maintenance*—no additional cylinders—readily removable turbine units . . . *ease of operation*—no additional controls—no specialized training of flight crews.

▶ The production of the Turbo-Cyclone 18 fulfills today's requirements for optimum economy and performance in long range aircraft.

▶ Another example of Wright engineering leadership in developing new power-plants for the aviation industry.

POWER FOR AIR PROGRESS

WRIGHT

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NEWS DIGEST

DOMESTIC

American Overseas Airlines sale to Pan American Airways reportedly is under discussion. At midweek, neither carrier would comment. New York financial circles state that PAA made initial overtures several weeks ago and that American Airlines countered with a different proposal.

Civil aircraft shipments in September totaled 590, valued at $9,454,937, Census Bureau reported. Value of aircraft, parts and other products was $13,569,939. Civil engine shipments totaled 447, valued (with parts and other products) at $4,458,890. No data on military shipments were given. August results, disclosed for first time on report for September, were: 700 aircraft, valued at $9,869,566, with value of plane, parts and other products at $13,706,872; 660 civil engines (with parts and other products) valued at $3,649,391.

Boeing Airplane Co. delivered the first B-47 Stratojet swept-wing bomber to the Air Force and announced receipt of letter of intent for ten more B-47s.

Consolidated Vultee Aircraft Corp. received CAA approval for the thermal anti-icing system in Convair-Liner.

Northwest Airlines asked CAB approval to start coach service between Washington and the Twin Cities via Pittsburgh, Cleveland, Detroit and Milwaukee. Rate would be approximately 4 cents a mile.

FINANCIAL

Bell Aircraft Corp. reports net loss of $412,531 for nine months ending Sept. 30 on sales of $10,907,943. For like period last year, loss was $381,163 on sales of $10,645,705.

Northrop Aircraft Inc. reports net profit of $11,577 after taxes for first quarter of fiscal year, compared to $106,000 net profit for like period last year. Backlog is $89 million.

Grumman Aircraft Engineering Corp. declared dividend of $1 per share of common stock payable Dec. 21 to holders of record Dec. 11.

Bendix Aviation Corp. declared regular 50-cent quarterly dividend and 50-cent special year-end dividend payable Dec. 29 to holders of record Dec. 10.

FOREIGN

International air traffic transactions through IATA clearing house in London set a new monthly mark of $15,161,000 in September, exceeding by $2,844,000 the August total which also was a record. January-September transactions totaled $84 million, compared to $33 million in same period of 1947.

INDUSTRY OBSERVER

►U. S. Air Force and Bell Aircraft Co. are studying the application of turbojet and ramjet engines to the X-1 supersonic research plane in an effort to increase its speed and duration. Bell has tested ramjet engines on the XF-83 twin-jet fighter. The X-1 has been looped, slow-rolled and snap-rolled. It has been maneuvered extensively at supersonic speed, unintentionally on at least one occasion, when the power quit in a 3G turn. Flights are now being made only at the 50-55,000 ft. level because of the unpressurized cockpit. This is well below the 59,000 ft. altitude record by the British D.H. Vampire. In passing through the transonic zone, the elevator becomes absolutely useless for a brief period, exactly as predicted by wind tunnel tests.

►Naval Air Materiel Center, Philadelphia, is building a wingtip float of titanium, the new wonder metal slated for extensive aviation use. The float will be tested for comparison with duraluminum, steel, magnesium and other floats on which data have been obtained.

►Final official record of deHavilland DH-108 sonic dive performance is Mach number 1.04, representing a speed of 688.48 mph. at 35,332 ft. Both Mach number and speed rapidly diminished as the swept-wing research plane began its pullout shortly thereafter.

►Piasecki XJP-1 is now undergoing flight tests at Naval Air Test Center, Patuxent, Md. It is a five-six place utility design following the big rescuer's lines but featuring overlapping blades to permit carrier-deck elevator use.

►Prototypes of two new jet engines, each developing 6500 lb. thrust are being tested in Sweden. Both of all-Swedish design, one is an axial-flow type built by Swedish Aircraft Engine Co. and the other a centrifugal compressor developed by Stal Engine Co. Swedish Aircraft Engine Co. also is producing the British-designed Goblin engine under license from deHavilland.

►Saab has orders for 10 Scandias from A.B.A., with other contracts in sight. The Swedish manufacturer, however, has not been pushing sales too strongly. It doesn't want to build up a large backlog and a consequent heavy inventory of material when delivery dates would have to be several years away. Because of this cautious approach the company estimates its development costs on the Scandia at around $2 million.

►Since the British Tudor fiasco British Overseas Airways Corp. is being permitted to play a much more important role in specifications and designs for future British transports. The Tudors, and several other British transport designs, were designed under supervision of the Ministry of Supply and British airlines were barely consulted.

►North American is putting 20 more surplus AT-6 trainers through overhaul for Venezuela, and three for the Philippine Air Force. A short time ago Argentine Navy ordered 30, and 42 were ordered by Siam for its Army and Navy.

►The Curtis L. Davis baffled Venturi engine silencer is drawing wide interest—and orders. Small horsepower sample has been delivered to CAA for tests. Larger experimental units are being made for a C-47. Midget model has been designed to stifle the crackle of model airplane engines and orders for 10,000 units are in prospect. Two Stinson owners have purchased the silencer—to muffle the factory-supplied mufflers on their planes. Production still is a one-man show by inventor Davis, at Compton (Calif.) Airport. He is dickering with manufacturers for mass production.

►Mid-February now is the target date for first use of the Los Angeles Airport FIDO installation. Originally the burners were to be touched off this fall. Difficulty in obtaining accessory equipment forced delay of inauguration.

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AVIATION WEEK

Dec. 13, 1948

CAA Studying Huge Pilot Training Center

May locate $14,000,000 project at Ardmore, Okla., American Airlines school site.

By Robert Hotz

Plans for establishing a central pilot training school at which the Civil Aeronautics Administration would train all U. S. civil and military transport pilots are being explored by CAA Administrator Delos W. Rentzel.

Main purpose of the central training school would be to provide a uniform standard of transport pilot efficiency for all civil and military pilots engaged in transport operations. It would also be aimed at providing adequate pilot training in the use of the new all-weather airways equipment.

▶ **Reduce Expenses**—Other objectives sought include adequate training of CAA flight inspectors on modern transport types and reducing the airlines' annual outlay for training expenses. Under Rentzel's proposed plan the CAA would finance the entire school and charge airlines and other organizations that wished personnel trained a nominal fee for the courses offered. Air Transport Assn. estimates that U. S. airlines spend from $35,000,000 to $50,000,000 annually on training of all kinds.

There are now about 6200 airline pilots and another 1000 civilian pilots engaged in nonscheduled transport operations. In addition to these pilots and their supplementary crews, CAA would offer the central school to train transport pilots for MATS, U. S. Air Force, Navy and friendly foreign countries. Top CAA and Commerce Department officials feel that the new all-weather airways will require a uniform standard of crew training that cannot be provided by individual airline training programs.

▶ **Seek Screening**—They also feel that there must be a more satisfactory method of weeding out incompetent pilots than is provided in the joint company-union procedures now used. There has been some criticism that CAA flight inspectors did not have sufficient experience in post-war transport types to warrant their passing judgment on the airline pilots they are to test.

Rentzel emphasized the tentative nature of the planning to date and said any final plan would require approval and support from the airlines, airline pilots, and other government agencies. He indicated that if this agreement could be reached, CAA hoped to provide training equipment that is now too expensive to be financed either by CAA alone for its own use or by individual airlines. CAA now needs modern type transports to train its air carrier inspectors and few airlines can finance any extensive outlays for the Dehmel type trainers that offer considerable economy in training crews on large aircraft.

Delos W. Rentzel

▶ **Economy Aim**—Rentzel said that the plans would go forward only if it was evident that considerable economy would result for both the government and the other groups concerned. Rentzel was expected to get a CAA study on the proposed school this week.

CAA plans tentatively call for taking over the American Airlines training school at Ardmore, Oklahoma, for the new central school. The new school would be equipped with 12 four-engine and six twin-engine transport types including Douglas DC-3, DC-4 and DC-6; Lockheed Constellation; Boeing Stratocruiser; Martin 202; and the Convair-Liner. These planes would be supplemented for training purposes by Dehmel type training simulators for each type plane used at the school. Cost of acquiring and equipping the school is estimated at $14,000,000.

Some CAA sources said a payment of between $125,000 and $150,000 might be made to American Airlines for its investment in the Ardmore school. Rentzel said that since American has no permanent equipment at Ardmore and planned to withdraw from the base early next year, there appeared no reason for any payment to American by CAA.

He said Ardmore had been given first consideration as a location for the CAA school because of its good weather, its position away from any heavy airways traffic and because its current occupants planned an early withdrawal.

American has operated the Ardmore school on lease from the city of Ardmore since June 1946. The city acquired the airfield from War Assets Administration as a gift. The field has four 7200 ft. runways; 2200 acres; two hangars; barrack type living quarters; and 20 air conditioned classrooms.

American has trained 3000 people at Ardmore including pilots, flight engineers, stewardesses, dispatchers and station agents. The school has a capacity of 150 students per month.

▶ **Close in May**—Present plans call for an end to American's training program in February and closing the base by next May. Operating cost of the school to American is estimated at $70,000 per month. American's present lease expires in February, 1951.

Rentzel's proposal revives an idea originally proposed by top American Airlines officials to have the Ardmore school conduct flight training for all airlines.

Rentzel first broached the subject of the central pilot training school to E. A. Cutrell, an American Airlines pilot who also represents the Air Line Pilots Assn. on several joint industry-government groups. Cutrell presented the proposal to the ALPA convention in Chicago last month where it was firmly rejected.

▶ **ALPA Rejection**—ALPA voted to pursue "a consistent and rigorous policy of attack" on the central school proposal. ALPA has objected to the American Ardmore school as an alleged method of screening pilots. Several grievance cases arose out of ALPA members failure to pass the Ardmore tests.

Air Transport Assn. has been informed of the Rentzel plan but has taken no official stand as yet. Individual airlines have not yet been approached by CAA on the matter.

A preliminary CAA study on setting up the school at Ardmore indicated it was not feasible. CAA now operates a standardization school with roughly the same purposes at Oklahoma City, 90 miles from Ardmore. Rentzel ordered a new study of the matter which is now being prepared by L. J. Forsey and R. O. Brainerd of CAA.

▶ **No Money**—There is no provision for the project in the CAA budget for fiscal 1950. Any final decision on the plan would require Bureau of the Budget approval regardless of whether a supplemental appropriation will be sought next year. There has been some consideration of financing initial work on the project out of CAA funds earmarked for other purposes.

The proposed school would be run by a board of directors headed by Rentzel and staffed by CAA personnel.

Industry Divides On Plane Development

The proposed government-financed commercial plane development program is entangled in a thickening web of controversy.

Last week there were indications that not only is aircraft manufacturing opposition to the program consolidating, but that segments of the air transport industry are cooling on it.

▶ **Tentative Program**—The program, which will cost the government an estimated $50,000,000 a year in commercial cargo and transport plane development, is not likely to be authorized by Congress without solid industry backing. The "tentative" program that has been blueprinted by the informally-organized inter-departmental committee headed by Grant Mason, assistant to Assistant Secretary for Air Cornelius Vanderbilt Whitney, has divided the industry on the issue.

AVIATION WEEK reliably learned that the Mason committee contemplates the development of four conventional cargo types, convertible to transports, as follows:

(1) **A small feederliner,** with approximately two and a half tons capacity, and an operational speed of about 100 mph. The plane would be roughly comparable to the Northrop Pioneer and the Beech Twin Quad, both of which have an operational speed of approximately 200 mph.

(2) **A short-haul cargo transport** with a capacity of approximately five tons. It would compare to Consolidated-Vultee's Convair-Liner and the Martin 2-0-2.

(3) **A long-haul cargo transport** with a capacity of approximately 15 tons, and comparable to the Boeing Stratocruiser, the Douglas DC-6, and the Lockheed Constellation.

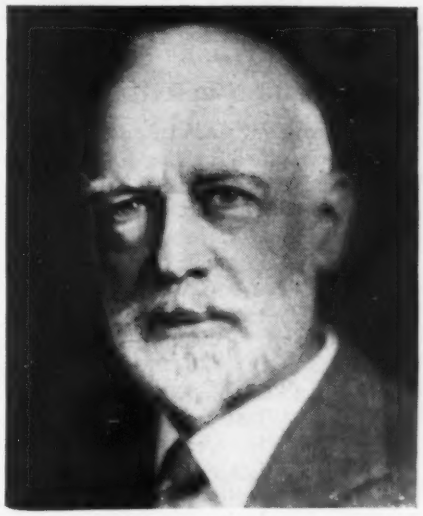
(4) **Another long-haul cargo transport** of the same type, but with pressurized cabin.

▶ **Jet Vetoed**—A fifth jet type was knocked out of the program, it is understood, after a preliminary review indicated that its operating cost would be so high as to make it utterly out of the question for commercial use.

The Mason committee's "tentative" program emphasizes conventional transport types. It makes no provision for the development of far advanced types which the private aircraft manufacturing industry cannot undertake, because of the large investment involved, and because the planes could not be marketed at prices the airlines could meet. Each of the types proposed in the program has a counterpart with similar characteristics and performance already available on the market.

▶ **Airline Interest**—With the government financing the development costs, the planes presumably would be available to airlines at prices below those of their already-existing counterparts. This fact has inclined some airline interests to look on the program with favor. On the other hand, estimates indicate that the operational costs on the proposed short-haul types would be higher than on the comparable Convair and Martin 2-0-2 craft and also that the operational costs on the long-haul type would be higher than on the comparable Stratocruiser, DC-6, and Constellation. Calculating that the higher operational cost would soon off-set the advantage of a lower purchase price, some airline interests have cooled on the program.

Durand to Get Wright Trophy



Dr. William F. Durand

Dr. William Frederick Durand, 89, of Palo Alto, Calif., will be given the first Wright Brothers Memorial Trophy. The new trophy is 14 in. high and features a replica of the original Wright biplane above a stone model of the Kitty Hawk monument. Funds for the trophy were donated by Dr. Godfrey Lowell Cabot, Boston. Winner was determined by a special committee of the National Aeronautics Association, trustees of the award.

The trophy will be awarded annually on Dec. 17 "for significant public service of enduring value to aviation in the United States." The award will not be made on the basis of a single technical or performance achievement but will be based on the total contribution of an individual, during his lifetime. It will not be made posthumously, except in the event the recipient dies between his selection and the presentation.

▶ **Academic Career**—Dr. Durand, who is a professor emeritus of mechanical engineering at Stanford University, was voted the award for his long and useful career in the field of aeronautical science.

Durand established basic aircraft propeller theory and performed early experimental work in this field, becoming a world authority on the subject. He was a founder-member of the National Advisory Committee for Aeronautics, serving as a member 1915-1933 and again 1941-1944. He was NACA chairman during World War I and enlisted the nation's colleges, universities and schools in the ground training program of the air service, including the setting up of flying schools operated by Canadian officers. During this period he designed the first wind tunnel at Langley Field.

▶ **Worked For NACA**—He was named scientific attache to the U. S. Embassy in Paris in 1917. Later in that year he returned to the U. S. where he headed a special NACA committee that developed the aircraft industry patent cross-license agreement. Dr. Durand served as a member and secretary of the Morrow board.

From 1929 to 1935 Dr. Durand edited and contributed to the "aerodynamic theory" series of monographs, now used as the basic text in aeronautical research and engineering. In 1941, at the age of 82, Dr. Durand was called back into service by President Roosevelt to coordinate the nation's industry and research establishments in the application of gas turbine power plants to the propulsion of aircraft, thus pioneering aircraft jet propulsion in the United States. In 1944 he retired, at the age of 86, and now serves as consultant to numerous municipal and national power projects.

Merit Awards

Air Force honors go to 81 civilians for their wartime activities.

The President's Certificate of Merit has been awarded by the Air Force to 81 civilians in the aviation industry, in recognition of their wartime services.

Mrs. Phillip G. Johnson, widow of the wartime president of Boeing Airplane Co., Seattle, Wash., has been asked to accept a posthumous award in recognition of her late husband's accomplishments in the production of bomber aircraft. Nineteen of the civilian aviation specialists from the west coast were to have received their awards at the semi-annual convention of the board of governors of the Aircraft Industries Assn.

▶**Statler Lunch**—Sec. Symington will present the other awards at a luncheon at the Statler Hotel, in Washington.

Each of the certificates is signed by Pres. Truman and bears the inscription, "For outstanding fidelity and meritorious conduct in aid of the war effort against the common enemies of the United States and its allies in World War II.

▶**Award List**—The 19 west coast civilians honored:

John L. Atwood, North American Aviation, Inc., Los Angeles, Calif., for airplane design and administrative organization.

Lawrence D. Bell, Bell Aircraft Corp., Buffalo, N. Y., for design, development and manufacture of military airplanes.

LaMotte T. Cohu, Northrop Aircraft, Inc., San Diego, Calif., for design, development and production of night fighter aircraft.

Donald W. Douglas, Douglas Aircraft Co., Santa Monica, Calif., for the manufacture and mass production of bombardment and cargo aircraft.

C. L. Egtvedt, Boeing Airplane Co., Seattle, Wash., for original development of B-17.

Robert E. Gross, Lockheed Aircraft Co., Burbank, Calif., for the manufacture and mass production of military aircraft.

Allan Hancock, Hancock College of Aeronautics, Santa Monica, Calif., for outstanding services in pioneering in 1939 in the civilian flying training program of the Army Air Forces.

Fred W. Herman, Douglas Aircraft Co., for engineering and production of aircraft.

Hall Hibbard, Lockheed, for conception, design and perfection of many wartime combat airplanes, especially the P-38 and P-80 series.

George A. Huggins, Douglas, for manufacture and production of military aircraft.

William S. Jack, Aero Industries Corp., Cleveland, Ohio, for manufacture and mass production of intricate Aeronautical equipment.

James Howard Kindelberger, North American, for manufacture and mass production of military aircraft.

Isaac Machlin Laddon, Consolidated Vultee Aircraft Corp., San Diego, Calif., for design and construction of wartime aircraft especially the B-24.

Richard Stuart Mitchell, Consairway, San Diego, Calif., for services in connection with air carrier operations under contract to the Army Air Forces.

John K. Northrop, Northrop Aircraft, for aircraft, development and the perfection of the Flying Wing airplane.

Arthur E. Raymond, Douglas, for engineering, design, development and perfection of military aircraft such as the A-20, C-54 and A-26.

T. Claude Ryan, Ryan Aeronautical Co., San Diego, Calif., for services in pioneering in 1939 the civilian flying training program of the Army Air Forces.

Harry Woodhead, Consolidated Vultee, for the manufacture and mass production of large and small military aircraft.

E. C. Wells, Boeing, for engineering of modification on the B-29.

• The 61 civilians invited to attend the luncheon at the Hotel Statler:

W. E. Beall, Boeing Airplane Co., Seattle, Wash., for engineering and modification work on B-17 and B-29 bombers.

C. C. Moseley, Cal-Aero Academy, Glendale, Calif., for services in pioneering civilian flying training program of the Army Air Forces.

Stanley C. Allyn, National Cash Register Co., Dayton, Ohio, for production of bomb sight assemblies.

Werner J. Blanchard, Aeroproducts Div., GMC, Dayton, Ohio, for the development of hydraulically controlled aircraft propellers. (Blanchard was killed before he could receive the award. See story page 15.)

Richard S. Boutelle, Fairchild Engine and Airplane Corp., Hagerstown, Md., for production of military aircraft.

Ernest R. Breech, Bendix Aviation Corp., Teterboro, N. J., for production of equipment for planes, ships and transport vehicles.

Mead L. Bricker, Willow Run bomber plant, Ft. Dearborn, Mich., for production of bomber aircraft.

James V. Carmichael, Georgia div., Bell Aircraft Corp., Marietta, Ga., for production of bomber aircraft.

George T. Christopher, Aircraft Engineering div., Packard, Detroit, Mich., for production of aircraft engines.

Robert L. Earle, Curtiss-Wright Corp., Dayton, Ohio, for the production of steel aircraft propellers.

William K. Ebel, Glenn L. Martin Co., Baltimore, Md., for the engineering and development of military aircraft.

Malcolm P. Ferguson, Western division, Bendix Aviation Corp., for engineering and manufacture of aircraft products.

Dr. F. W. Reichelderfer, Chief, U. S. Weather Bureau, Washington, D. C., for meteorological research.

Walter O. Briggs, Briggs Manufacturing Co., Cleveland, Ohio, for production of aircraft and aircraft parts.

Edward F. Fisher, Fisher Body div., GMC, Detroit, Mich., for production of fighter and bomber aircraft.

William P. Gwinn, Pratt and Whitney div., United Aircraft, for engineering and installing engines in prototype planes.

Joseph T. Hartson, Glenn L. Martin Co., Omaha, Neb., for the production of military planes.

Ronald M. Hazen, Allison div., GMC, Indianapolis, Ind., for aircraft engine development.

W. C. Heath, A. O. Smith Corp., Milwaukee, Wis., for the manufacture of steel propeller blades for aircraft.

S. D. Heron, Ethyl Gasoline Corp., Detroit, Mich., for the development of aircraft engine fuels and lubricants.

L. S. Hobbs, Pratt and Whitney div., United Aircraft, East Hartford, Conn., for engineering, research, design and development of engines for aircraft.

H. Mansfield Horner, Pratt and Whitney div., United Aircraft, for production of trainers and heavy bombardment aircraft.

Ormond E. Hunt, GMC, Detroit, Mich., for mass production of high precision aircraft equipment.

Alexander Kartveli, Republic Aviation Corp., Farmingdale, L. I., for development and design of amphibian and pursuit planes.

William D. Kennedy, Wright Aeronautical Corp., Woodridge, N. J., for construction of aircraft engines.

Chester H. Lang, General Electric, Schenectady, N. Y., for assistance in development of B-29 remote control turret system.

Raymond P. Lansing, Eclipse-Pioneer div., Bendix, for production of aircraft instruments and accessories.

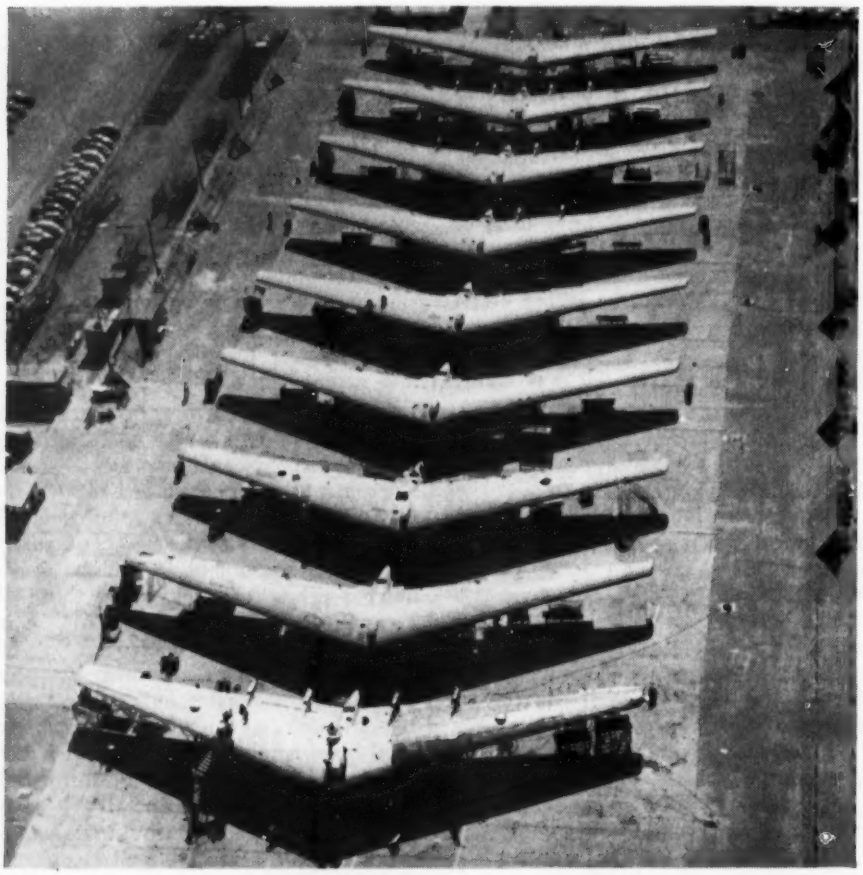
Paul W. Litchfield, Goodyear Aircraft Corp., Akron, Ohio, for the manufacture of aircraft parts and subassemblies.

Dr. H. E. Heinecke, Eglin AFB, Valparaiso, Florida, for services as a bombing project physicist.

Frank L. Magee, Production div., Aluminum Co. of America, Pittsburgh, Penn., for services in meeting aircraft industry aluminum requirements.

Glenn L. Martin, Glenn L. Martin Co., Baltimore, Md., for mass production of airplanes.

Earle Martin, Glenn L. Martin Co., for mass production of airplanes.



NORTHROP'S CHEVRONS

Nine piston-powered B-35s, almost the entire production to date of the large Flying Wing bombers, lined up outside Northrop Aircraft's plant where they will undergo conversion to jet power and then be redesignated RB-35s.

R. C. Muir, Apparatus dept., General Electric, Schenectady, N. Y., for developing first American-made jet engine.

E. B. Newill, Allison div., General Motors, Indianapolis, Ind., for production of aircraft turbojet engines.

Ewell Phillips, Power Plant Lab., AMC, Wright-Patterson AFB, Dayton, Ohio, for research and development of aircraft power plants.

J. Earl Schaefer, Wichita div., Boeing, for production of primary training aircraft.

Igor I. Sikorsky, Sikorsky Aircraft div., United Aircraft, Bridgeport, Conn., for design of first successful helicopter.

Frederick C. Crawford, Thompson Products, Inc., Cleveland, Ohio, for production of aircraft valves and engine parts.

Harlow H. Curtice, Buick div., GMC, Flint, Mich., for production of Pratt & Whitney aircraft engines.

Ralph S. Damon, Republic Aviation Corp., Farmingdale, L. I., for the development and production of combat aircraft.

Hugh Dean, Chevrolet Motor div., GMC, Detroit, Mich., for the production of Pratt and Whitney aircraft engines.

Guy W. Vaughan, Wright Aero Corp., for contributing to advancement of aircraft industry.

J. G. Vincent, Packard Motor Car Co., Detroit, Mich., for development of aircraft engines.

J. Carlton Ward, Jr., Fairchild Engine and Airplane Corp., for production of primary trainers and cargo planes.

Albert J. Weatherhead, Jr., Weatherhead Co., Cleveland, Ohio, for development and production of aircraft accessories and equipment.

Alfred M. Wilson, Aeronautical div., Minneapolis-Honeywell Regulator Co., Minneapolis, Minn., for production of automatic pilot and turbosupercharger regulators.

Burdette S. Wright, Airplane div., Curtiss-Wright, for mass production of aircraft.

Raymond W. Young, Wright Aeronautical Corp., for production of aircraft engines.

C. C. Pearson, Curtiss-Wright, for mass production of military aircraft.

D. S. Momand, American Red Cross, New York City, for services to the Army Air Forces in Great Britain and Europe.

Paul F. Collins, Northeast Airlines, Boston, Mass., for services in connection with air carrier operations under contract to the Army Air Forces.

William Coulter, Western Air Lines, Inc., Los Angeles, Calif., for services in connection with air carrier operations under contract to the Army Air Forces.

Croll Hunter, Northeast Airlines, Inc., Boston, Mass., for services in connection with air carrier operations under contract to the Army Air Forces.

A. N. Kemp, American Airlines, Inc., New York, N. Y., for services in connection with air carrier operations under contract to the Army Air Forces.

W. A. Patterson, United Air Lines, Chicago, Ill., for services in connection with air carrier operations under contract to the Army Air Forces.

Maxwell W. Balfour, Spartan School of Aeronautics, Tulsa, Okla., for flying training services for the Army Air Forces.

Harold S. Darr, Darr Aero Tech. Inc., Chicago School of Aeronautics, Inc., for flying training services for the Army Air Forces.

William F. Long, Dallas Aviation School, Dallas, Texas, for flying training services for the Army Air Forces.

Oliver L. Parks, Alabama Institute of Aeronautics, Inc., Parks Air College, Inc., East St. Louis, Ill., for flying training services for the Army Air Forces.

John P. Riddle, Embry-Riddle School of Aviation, Miami, Florida, for flying training services for the Army Air Forces.

W. C. Skelley, Spartan School of Aeronautics, Tulsa, Okla., for flying training services for the Army Air Forces.

W. J. Blanchard Killed

W. J. (Pete) Blanchard, general manager of the Aeroproducts Propeller division of General Motors Corp., was killed in the crash of a plane he was piloting near Columbus. A former Curtiss Propeller engineer, Blanchard was co-inventor of the hydraulic steel Aeroprop propeller which his division manufactured. He was past president of the Dayton, Ohio, Chamber of Commerce, and widely known in aviation technical groups.

Standards Project Made Permanent

Joint Air Force-Navy-industry committee, reviewing accomplishments of SAE group E-25, makes decision.

Success of the first year's work on standardizing engine and propeller utility parts has resulted in a continuing program on a permanent basis, representatives of the Air Force, Navy and industry announced last week in Washington.

A total of 1783 stock items have been issued as standards with an additional 4333 items to be completed by January, it was reported to the ANI committee since work began under an agreement that was completed Dec. 16, 1947.

▶**SAE Committee**—The policy-making ANI committee at that time assigned the task of developing the standards to a reorganized SAE Committee E-25 which included other representatives of the services and industry on a technical level. Industry members of the ANI committee include C. E. Mines, Packard Motors; W. A. Parkins, Pratt & Whitney division, United Aircraft, and R. W. Young, Wright Aeronautical Corp.

SAE Committee E-25 established 47 projects during approximately 12 meetings held at near-monthly intervals. Of these, 33 projects will have been completed by the end of January 1949, representing a total of 6116 standard stock items.

A summary of projects now approved and published includes seven gasket standards and 36 bolt standards, with a total of 1783 separate standard parts.

▶**Woodruff Key Standards**—Approved and ready for publication are two Woodruff key standards with a total of 54 separate standard parts covered by drawings.

Additional standards, all of which have been approved by the E-25 committee, but which have not yet been fully reviewed by services and industry include flat head pins, lockwire, flat Fillister head screws, propeller governor gasket, oval Fillister head screws, rivets, washers, plugs, screws, high temperature rivets, dowel pins, nuts, plugs, as well as additional bolt and gasket standards.

Other standards which are in earlier stage of development include studs (straight and stepped); metallic gaskets, plugs (dryseal thread); high temperature plug and gasket, high temperature bolts, high temperature nuts, cotter pins, tab washers, spanner nuts, cone (union), coupling (union), tube tolerances for induction brazing, cover plates, threaded bushings, screw head (hexagon nut), self-locking nuts, locking pins, socket headed screws, hexagons and clevis bolts.

▶**SAE Committee Praised**—At the recent session in Washington the ANI group praised the accomplishment of the SAE Committee E-25, and voted to place the standardization of engine and propeller utility parts on a continuing basis, subject to annual reviews.

It was decided that the industry-developed standards would be issued on the regular Army-Navy format, but with a notation that the standard was one not subject to change without prior consultation with industry on any changes.

It was decided that if it were possible to change an existing AN standard by adding a size or making some similar change which would not affect the previous use of the standard, that this would be done, in order to prevent duplication of standards which otherwise would be necessary.

Industry representatives further indicated that if standards proposed by SAE Committee E-25 were not passed upon by the services, the standards would be issued as SAE standards.

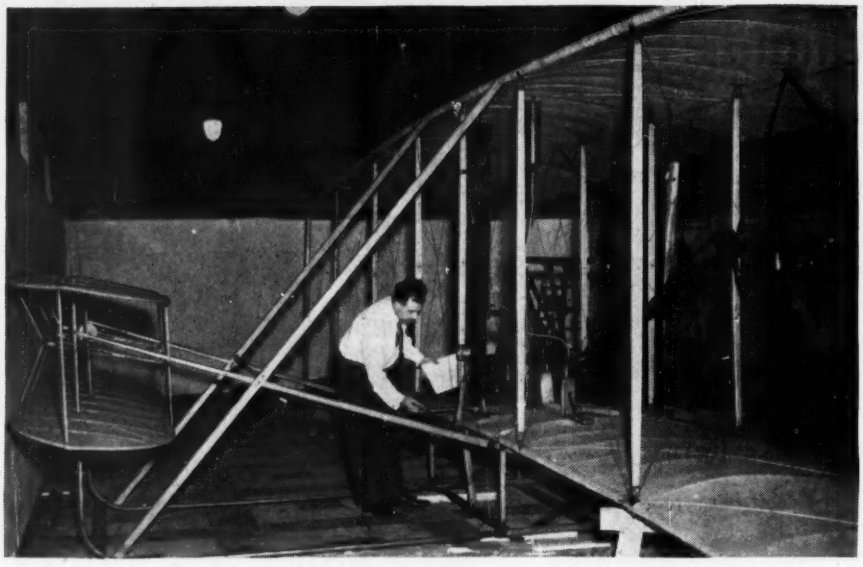
▶**Final Judge**—It was pointed out at the meeting that the ANI committee was relying upon the SAE Committee E-25 as the final judge as to whether new standards were needed or not, so that it was likely most standards developed would get service approval.

Meetings held on the projects have run from 12 to 16 hr. of actual committee sessions, and it is estimated that a total of 16,394 manhours have been contributed by technical personnel of the companies participating, including work of the manufacturer's engineering, drafting and reproduction units.

Standardization work has been coordinated with the Engine Technical Committee and the Propeller Technical Committee of the Aircraft Industries Assn., through the work of J. H. Sidebottom, assistant technical director of Aircraft Industries Assn. and secretary to the engine and propeller technical committees.

Charles Dycer Dies

Charles Dycer, formerly a key official in the Civil Aeronautics Administration office of aviation safety died recently after several months illness. Dycer headed the aircraft and components service of the safety office and as such was responsible for the certification of transport type aircraft and their equipment. He resigned from the CAA last summer.



Original Wright plane, being inspected by Curator Paul Garber, will have the place of honor in the Air Museum of the Smithsonian Institution—which once rejected it.

Wright Plane Back Home at Last

Craft completes its 45-year journey from Dayton to Museum in Washington via Kitty Hawk and London.

By Alexander McSurely

Heavier-than-air powered flight is 45 years old this week. The authentic story of the plane that made that flight and sired a multi-billion dollar aviation industry seldom has been told. It is reported here by an AVIATION WEEK *staff member who knew the late Orville Wright well and covered his activities for a number of years.*

A travel-worn and venerable airplane whose everlasting frame rests securely on a total flight performance of less than two minutes duration on a single day nearly half-century ago, assumes first place of honor this week in the National Museum at Washington.

At 10 am. on Dec. 17, the 45th anniversary of the Wright Brothers first power plane flights at Kitty Hawk, N. C. in 1903, the reassembled "Flyer" will be unveiled. The ceremonies will be attended by President Truman, representatives of many foreign nations, and relatives of the Wright Brothers, who will make the presentation of the airplane to the Museum.

The plane will be suspended at the principal entrance to the Arts and Industries Building of the Museum, in the North Hall—the place formerly occupied by Lindbergh's "Spirit of St. Louis." The Ryan monoplane has been moved farther back in the hall behind the Flyer.

The airplane was returned recently from the Science Museum in South Kensington, England, after a 20-year stay on foreign soil. (AVIATION WEEK, Nov. 29).

▶ **Unharmed by Blitzes**—The two decades in England took the old plane through the bombing raids of World War II, but it emerged unharmed. The British had carefully disassembled the Flyer, packed it into subterranean safekeeping of a secret bomb shelter and kept it there until war's end. Meanwhile the Science Museum suffered shattered windows and other structural damage in the nightly blitzes which might otherwise have finished off the old airplane.

The original Kitty Hawk biplane was first pieced together by Wilbur and Orville Wright and their mechanic, Charley Taylor, in the Wright cycle shop in Dayton, Ohio, early in 1903.

In September of that year they shipped the crated subassemblies of the 40-ft. wingspan biplane, and her 12-hp. four-cylinder engine to Kitty Hawk, a lonely North Carolina coast settlement.

Propeller shafts were too light and had to be repeatedly reworked. Finally, Orville Wright went to Dayton himself, built new shafts out of solid tool steel, and brought them back to Kitty Hawk.

▶ **Toss of Coin**—A few days later the plane was ready, and Wilbur, who had won the toss of a coin, launched the biplane after a short run on a wooden monorail laid down the incline of Kill Devil hill. If he had not overcontrolled the front elevators, he might have been the first to fly. But he tilted the horizontal planes too abruptly, the biplane nosed up into stalling condition, and whipped to the ground. Impact caused damage to the front elevator and the landing skids, and it was two days before the plane was ready to fly.

Summarized, the famous four first flights at Kitty Hawk on Dec. 17, 1903 were:

- 1. Orville Wright pilot, 120 ft., 12 sec.
- 2. Wilbur Wright pilot, 200 ft., 13 sec.
- 3. Orville Wright pilot, 200 ft., 15 sec.
- 4. Wilbur Wright pilot, 852 ft., 59 sec.

Wilbur's landing after the fourth flight resulted in damage to the front rudder. This would have required a day or two more in repairs. But then, a sudden gust of wind which was blowing at around 25 to 27 mph. velocity during the flights, overturned the airplane and smashed wing ribs, motor and guides which carried the chain drives from the motor to the two pusher propellers. The Wrights decided on a major repair job at home before undertaking any more flights.

▶ **Shipped Home**—They hurriedly gathered the pieces of the shattered plane into two boxes and a barrel to be shipped to Dayton. There they remained for years, practically ignored. Meanwhile the Wrights went on to build later and better airplanes instead of repairing the first one.

Next record of the original Kitty Hawk power plane is in a letter of Mar. 26, 1910 from Wilbur Wright to Charles Walcott, secretary of the Smithsonian Institution. The letter makes an offer which is often overlooked, to place the first power plane in the National Museum at that time.

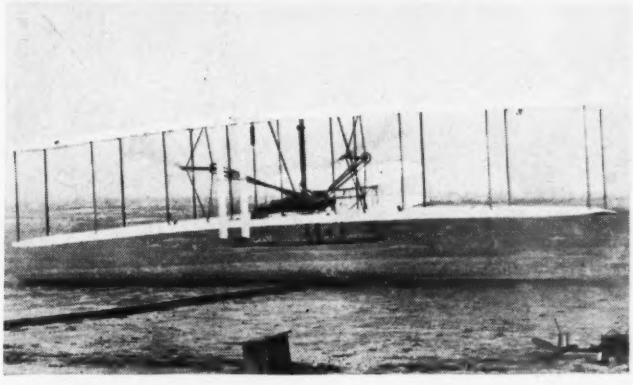
"We can reconstruct the 1903 machine with which the first flights were made at Kitty Hawk," Wilbur wrote. "Most of the parts are still in existence. This machine would occupy a space 40 ft. by 20 ft. by 8 ft."

▶ **Unwanted**—If Mr. Walcott had accepted the offer, there would probably have never been the long and bitter controversy between the Wrights and the Smithsonian Institution. But his reply on Apr. 11, 1910 gave the Wrights the impression that their 1903 Flyer was not wanted in the National Museum. The letter expressed a preference for the 1908 machine flown by Orville Wright at Ft. Myer. (Later the Museum acquired from the Army and still exhibits the 1909 Wright army plane).

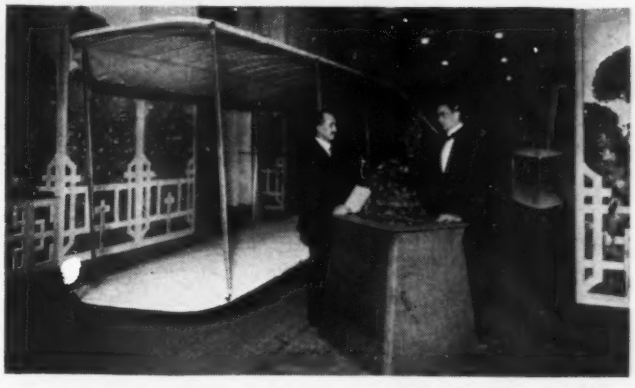
In 1914, the Smithsonian Institution permitted Glenn Curtiss, rival airplane builder and pilot, to attempt to fly the old Langley Aerodrome, built by Samuel Pierpont Langley, as a

The story of the world's first successful airplane started in Dayton, Ohio, when Orville (left) and Wilbur Wright built it . . .

. . . In their bicycle shop next door to their home, and shipped it by rail and boat to Kitty Hawk, N. C., where on Dec. 17, 1903 . . .



. . . Orville made the first flight. A high wind wrecked the plane and it was not reassembled until 1917. It was shown twice . . .



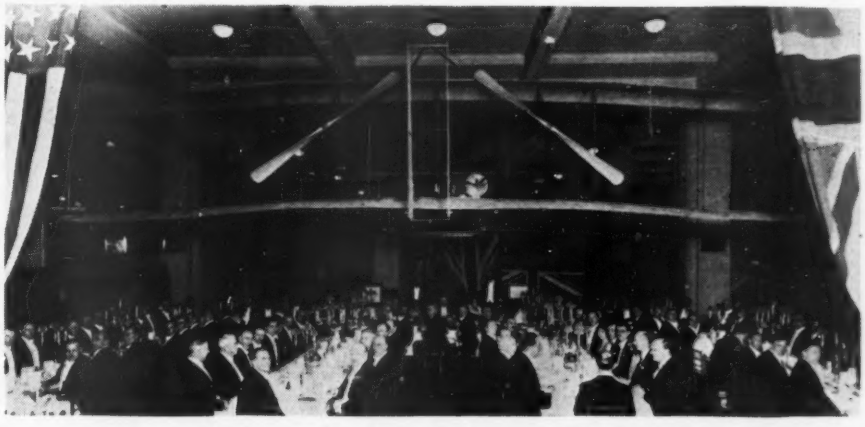
. . . Once at a New York aeronautics exhibit where it was photographed with Orville and Glenn Martin (right). Next stop was . . .

project of the Smithsonian Institution.

The Langley plane, which resembled a dragonfly in configuration, had failed twice in attempted launchings from a houseboat in the Potomac river near Washington, in 1903, prior to the Wrights successful flights. In 1914, Curtiss was involved with the Wright Brothers company in patent litigation. Dr. Albert Zahm, his chief expert witness, was also on the staff of the Smithsonian Institution. Zahm and Curtiss rebuilt the old Aerodrome, making a total of 35 changes, afterward acknowledged by the Smithsonian.

▶ **Alterations Exposed**—Orville Wright discovered those changes by comparing photos of the 1914 Aerodrome, as flown for a few seconds by Curtiss, with the original Aerodrome as described and sketched in great detail in Dr. Langley's memoirs. Griffith Brewer, president of the Royal Aeronautical Society of Great Britain, and a close friend of Orville Wright, witnessed the Curtiss flights at Hammondsport, N. Y., and made a close inspection of the alterations on the Aerodrome. Brewer afterward made the first exposure of the alterations in a letter to the New York Times. Subsequently he gave a paper before his Society in England, further publicizing the changes.

Sometime prior to 1917, Orville Wright decided to restore the Kitty Hawk. He obtained a duplicate of the original "Pride of The West" muslin fabric from the successor to the company which had made the original wing covering material, and spent long hours in the reconstruction project, following the original drawings and descriptions still in his files.



. . . London, where the plane went in 1928 and was suspended over the tables at a dinner given by the Royal Aeronautical Society to commemorate the 25th anniversary of flight.

The Kitty Hawk biplane was exhibited at least twice in this country before it was shipped to England in 1928. Once was at the Massachusetts Institute of Technology in Boston, and again it was shown at a New York aeronautics show, when Orville Wright was pictured with the plane and the Michelin trophy with Glenn L. Martin.

▶ **Sent to England**—Brewer, who made frequent visits to Orville Wright at Dayton, urged his friend that if the original plane was not to be exhibited in the National Museum it should be sent to England. In 1928 this was done.

Essentially, the Wright Brothers Flyer was sent to England because of the long-argued question of whether the Wright airplane had been the first power plane capable of flight. The Smithsonian, through papers and statements, had indicated repeatedly that the Langley Aerodrome had been the first plane capable of flight and that this was demonstrated by the 1914 flights by

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Curtiss, ignoring the changes in the plane before those flights were made.

▶ **Wright's Position** – Orville Wright once defined his position thus: "There were thousands who could have flown the first plane but there was no one else in the world beside Wilbur and myself that had the scientific data for building a machine that would fly."

In October 1942, Dr. Charles G. Abbot, successor to Walcott as secretary of the Smithsonian, published a paper titled "The 1914 Tests of the Langley Aerodrome," which for the first time fully admitted the 35 changes and retracted earlier statements about the Aerodrome's capability of flight.

The following year, Orville Wright wrote to the Science Museum, indicating he wished the airplane returned after war's end. This wish was not made public until after Orville Wright's death last January.

The first power plane is destined eventually to be the central focal point of the new National Air Museum, for which plans are being prepared. It will be erected, if and when Congress provides necessary appropriations, at a location probably close to Washington National Airport, in Virginia. It will not be far from where Orville Wright flew his Ft. Myer test flights for the U. S. Army Signal Corps in 1908 and 1909.

No Choice Named To Replace Echols

Aircraft Industries Assn. board of governors last week examined qualifications of 11 nominees to succeed Maj. Gen. (ret.) Oliver P. Echols as president of AIA but made no immediate choice.

General Echols, who submitted his resignation in September to accept a post as chairman of the board, Northrop Aircraft, Inc., Hawthorne, Calif., was re-elected to serve until Feb. 1. At that time Capt. Leland D. Webb, USN (ret.), now vice president in charge of AIA's western office at Los Angeles, will become acting general manager. Webb's place on the West Coast will be taken by John M. Richards, now Webb's assistant.

J. H. Kindleberger, chairman of the board, North American Aviation Inc., was elected west coast vice president, succeeding William A. Allen, Boeing Malcolm Ferguson, president, Bendix Aviation Corp., was elected east coast vice president.

Named as new members of the board: LaMotte T. Cohu, president Consolidated Vultee Aircraft Corp., succeeding Harry Woodhead, former Convair president; Chester H. Lang, vice president, General Electric; Fred Crawford, president, Thompson Products, and C. J. Reese, president, Continental Motors Corp.

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Small aircraft owners will be glad to know that Mobiloil Aero in lighter grades—White Band, Gray Band and Gold Band—are now in freer supply. Heavier grades of Mobiloil Aero for commercial planes—Red Band and Green Band—are expected to be in freer supply early next year.

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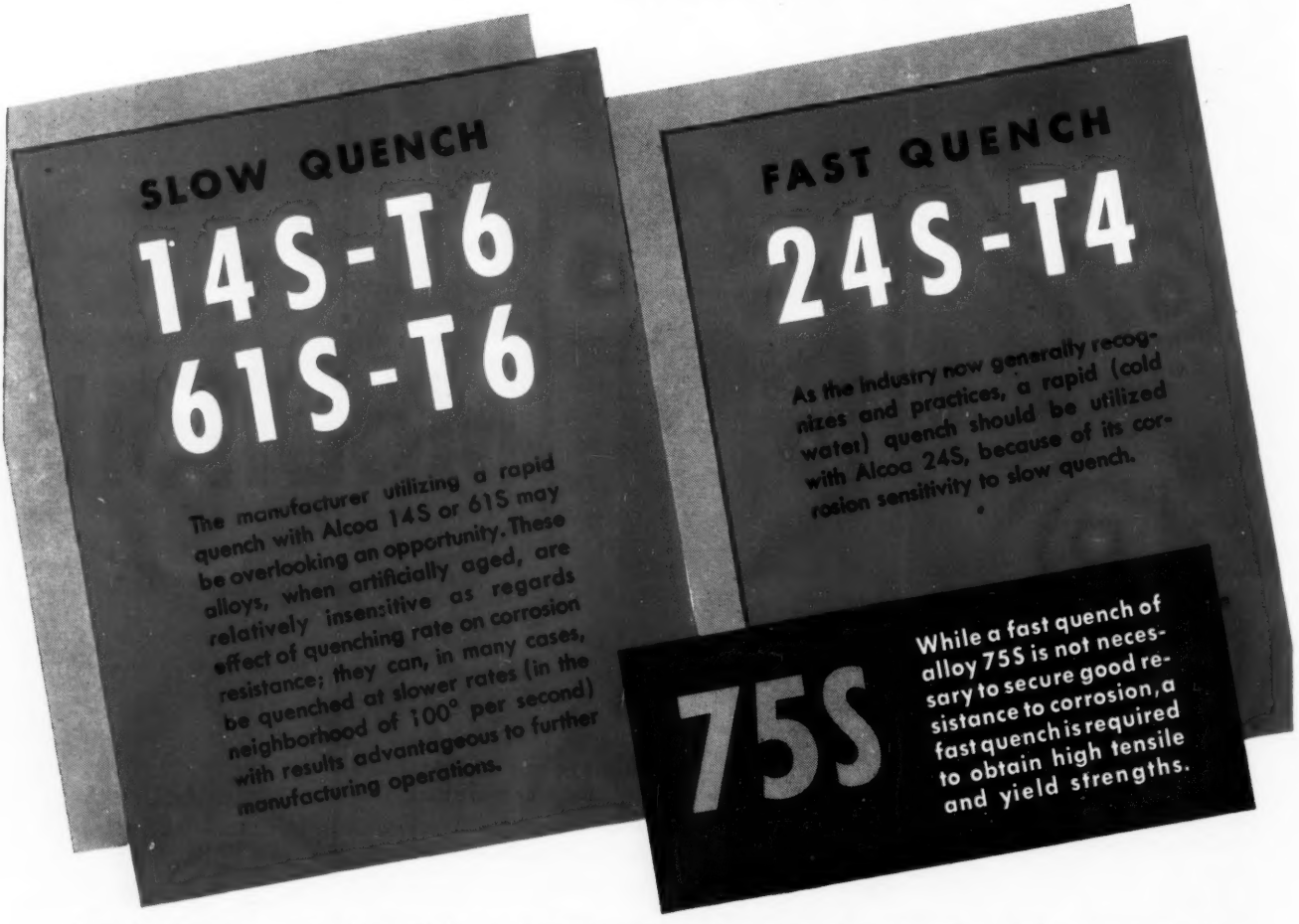
Because of the popularity of Alcoa 24S Alloy throughout the aircraft industry, and because of the sensitivity of 24S to slow quench, as regards its corrosion resistance, the industry has generally come to associate fast quenching with maintained corrosion resistance in all popular Alcoa Alloys.

Actually, *lowered resistance to corrosion does not always go hand in hand with slow quench.*


SLOW QUENCH
14S-T6
61S-T6
The manufacturer utilizing a rapid quench with Alcoa 14S or 61S may be overlooking an opportunity. These alloys, when artificially aged, are relatively insensitive as regards effect of quenching rate on corrosion resistance; they can, in many cases, be quenched at slower rates (in the neighborhood of 100° per second) with results advantageous to further manufacturing operations.
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As the industry now generally recognizes and practices, a rapid (cold water) quench should be utilized with Alcoa 24S, because of its corrosion sensitivity to slow quench.
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While a fast quench of alloy 75S is not necessary to secure good resistance to corrosion, a fast quench is required to obtain high tensile and yield strengths.

Complete information on quenching of high-strength 75S is available in booklet form from Alcoa. Further information on the other three alloys discussed will be supplied on request. ALUMINUM COMPANY OF AMERICA, 2182 Gulf Building, Pittsburgh 19, Penna.

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Convair Trainer

Civil transport greatly modified for Air Force instructional purposes.

Convair's recently acquired letter of intent for purchase of 37 T-29 twin-engine trainers by the U. S. Air Force will require modification of its commercial transport, the Convair-Liner, to meet military needs.

USAF order includes modifications for navigational and bombardier trainers that will boost the cost of the T-29s considerably over the Liner price.

▶**Bomber Version**—The T-29 bombardier version (top and middle sketch) will feature two bomb bays designed to carry 7200 lb. of practice bombs. One bomb bay will be located forward of the wing with the other just aft of the wing roots. Both will be outside the pressurized area.

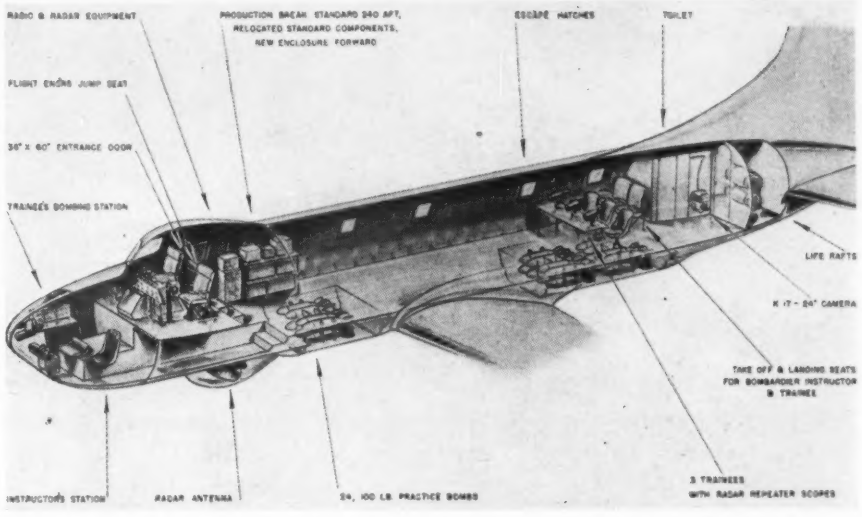
Cabin will be devoted to installations of aerial cameras for recording bombing results and stations for three bombardiers including radar scopes for observing radar bombing techniques.

A plastic bombardier-type nose will be fitted to the plane and an access tunnel provided from the cockpit to the nose. One post will be provided in the nose for bombing with a visual bombsight and two posts for radar bombing, one to be occupied by an instructor and the other by a trainee.

A radome to house radar antenna will be added to the belly just below the cockpit. Trainees in the cabin will be able to observe radar operations in the nose through their duplicate scopes. A jump seat for a flight engineer will be added between seats for pilot and co-pilot. The bombardier version will have a tactical operating altitude of 25,000 ft. at a speed of 290 mph. It will gross 42,172 lb. and have an endurance at its tactical altitude of 7½ hr.

▶**Navigation Version**—The navigation trainer (lower sketch) will have 14 navigators' posts with complete equipment including loran scopes, working desks, duplicate instrument panels and drift-meters. Six astrodomes will be installed along the top of the cabin. Navigation trainer will gross 41,577 lb. and have a tactical altitude of 20,000 ft. Speed at that altitude will be 250 mph. with an endurance of 10 hr. In addition to the 14 student navigators, four instructors will be carried.

Both versions of the T-29 will be used for twin-engine pilot and flight engineer transitional training.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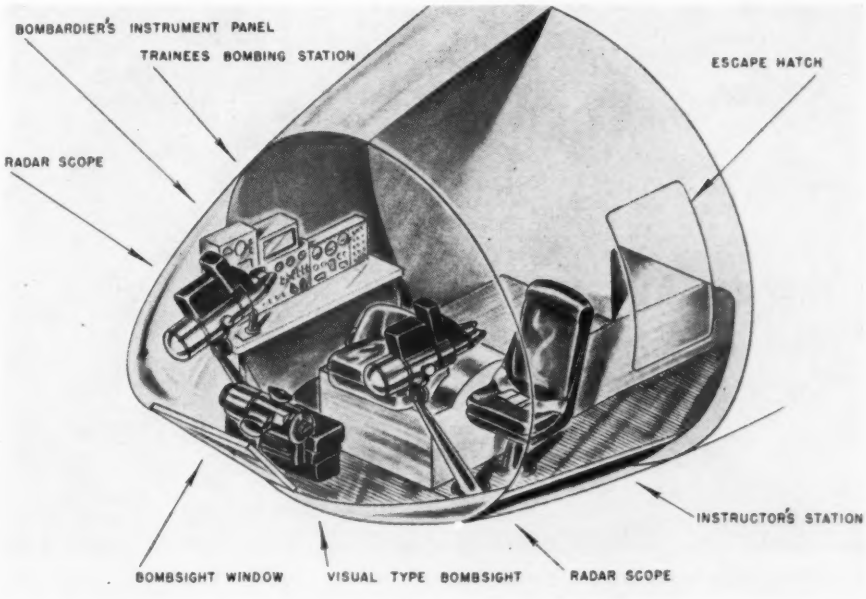
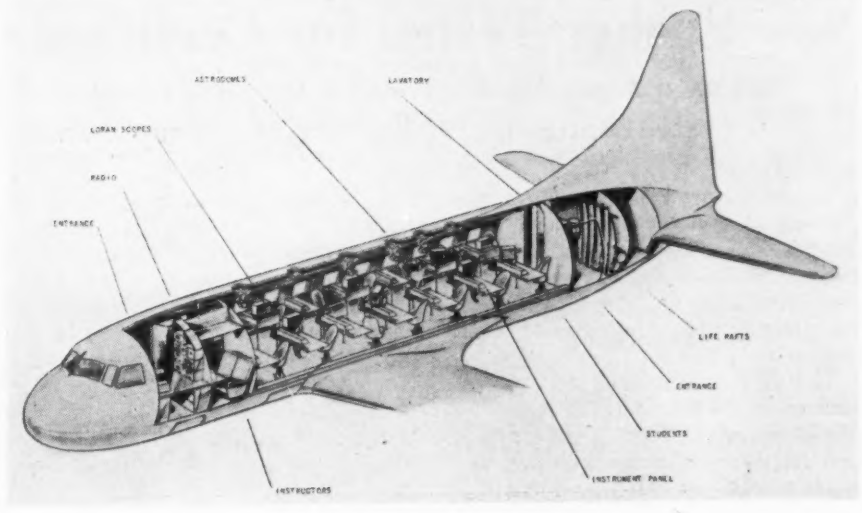
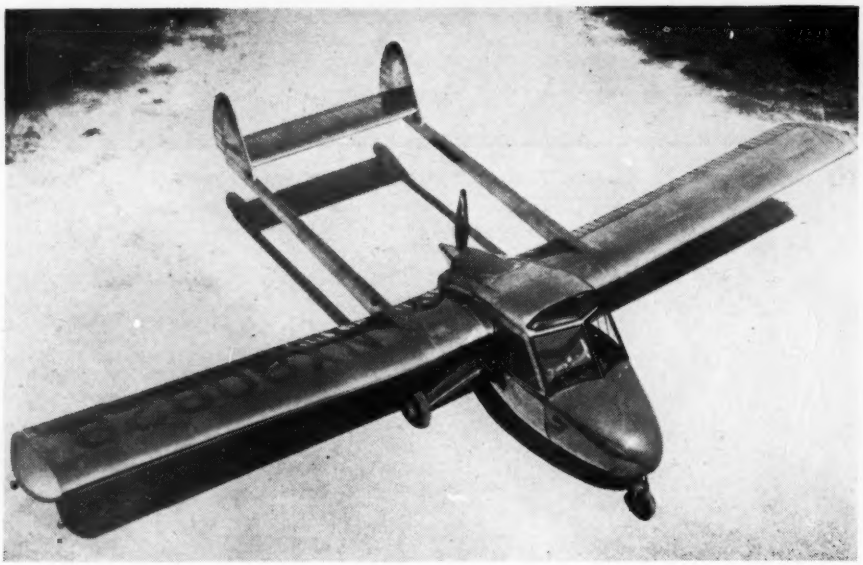
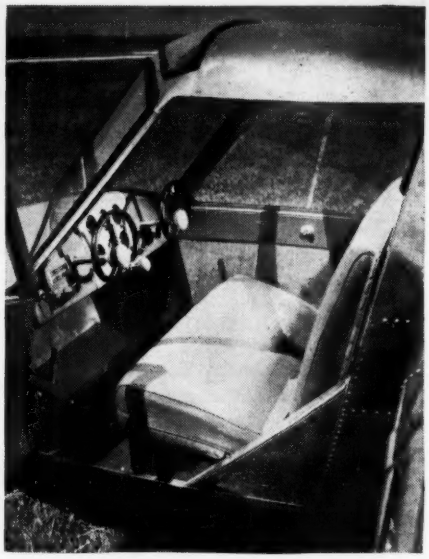


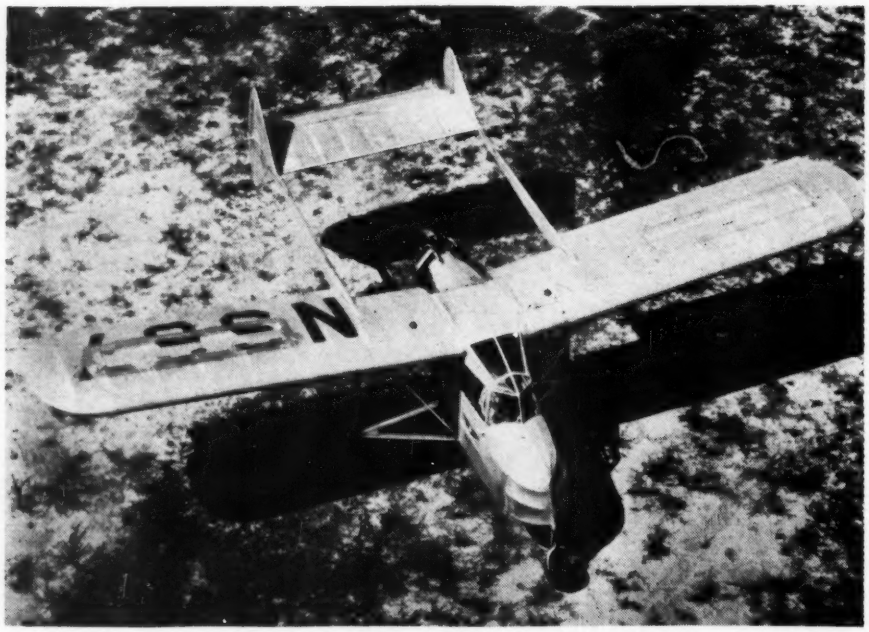




Twin booms and pusher engine of new personal plane give it resemblance to . . .



Visibility is emphasized in cabin.



. . . Weick W-1-A, the first two-control plane, from which came the modern Ercoupe.

New Pusher Tested for Certificate

Anderson Greenwood 14 slated for production early next year. Continental 90-hp. to give 110-mph. cruise.

One of the few two-place pusher-type personal planes to be developed since the war is currently being put through its paces in Texas. Known as the Anderson Greenwood 14, it is a semi-high wing monoplane with tail surfaces carried on twin tail booms.

The 14 was designed by Anderson, Greenwood & Co., a postwar corporation at Houston, Texas. CAA certification tests are underway and the company expects to start production in early spring. The price is to be announced later.

► **Resembles Weick**—The new plane is of all metal construction, powered by a Continental 90 hp. engine, and equipped with steerable tricycle landing gear. It has the general appearance of an up-to-date Weick W-1-A, forerunner of the present-day Ercoupe. It has dual controls, but since all essential maneuvers can be accomplished with the control wheel alone, rudder pedals are located on the left side only. Baggage is stowed in a large compartment conveniently located behind the seat. Fuel is carried in the leading edge of the wing.

The company points out that large variations in weight have only a minor effect on the flying trim of the airplane, since both fuel and baggage are located close to the center of gravity. Other points claimed for this plane are unrestricted vision, freedom from noise, and a general high level of comfort.

The initial flight of the 14 was made on Oct. 1, 1947. Since that time the plane has been flown 200 hr. and put through an intensive flight and accelerated service test program. Claims are that flight checks show performance equal to, or better than, conventional planes of similar power.

Only performance figures and specifications released to date are: Measured cruise, 110 mph.; indicated stalling speed at 1200 lb. with flaps, 44 mph.; without flaps, 49 mph.; range, 4 hr.; weight empty, 850 lb.; gross weight, 1400 lb.

Men responsible for design and development of the 14 are: Ben M. Anderson, president; Marvin Greenwood, vice president; and Lomis Slaughter Jr., secretary and chief engineer.

Galleys For Canadair

Weber Aircraft division of Weber Showcase & Fixture Co., Huntington Park, Calif., is manufacturing 22 special galleys for installation in Canadair Ltd.'s Canadair Fours being produced for British Overseas Airways Corp. Company also has designed and manufactured crew seats for Consolidated Vultee's new XP5Y-1 Navy patrol plane. Weber recently delivered nine galleys of special design for the Lockheed C-121.

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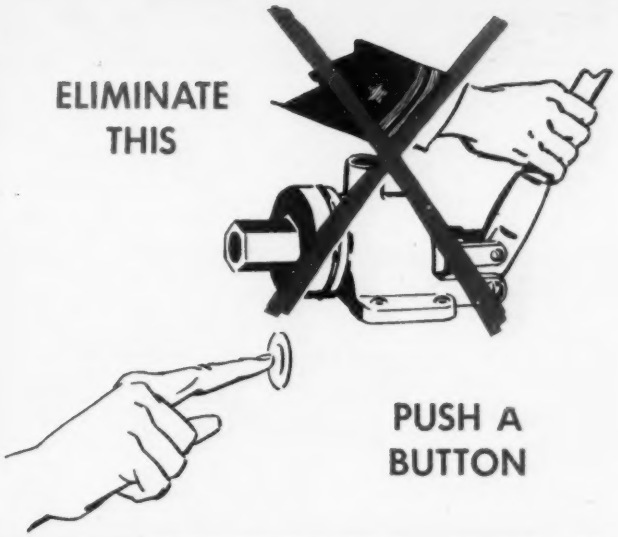

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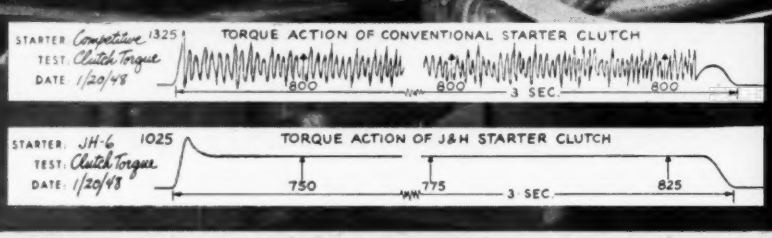

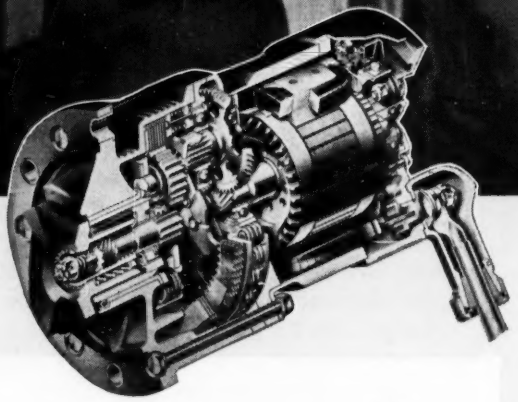

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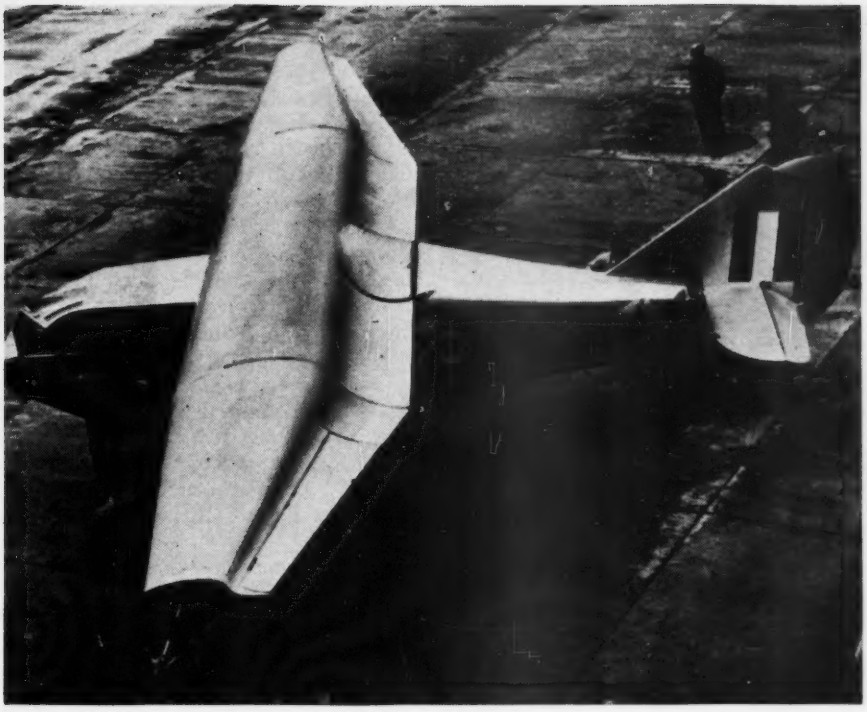
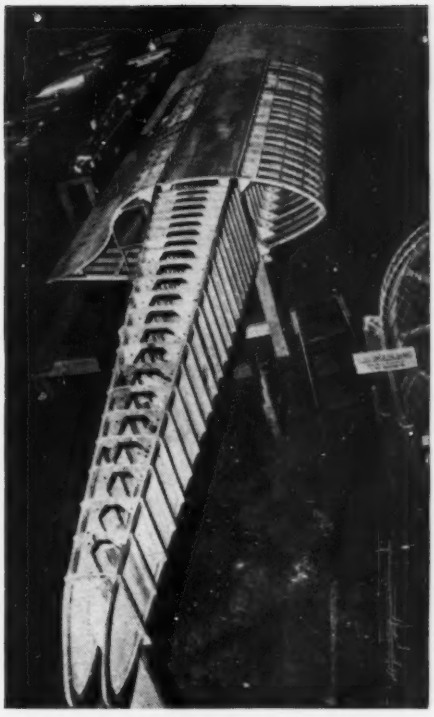




New suction wing developed in Australia is shown installed on de Havilland glider for pre-proving trials. Airfoil span is 56 ft. At right is seen outer wing torsion box assembly attached to center section. Suction duct is visible at point of sweep-down.

"Tadpole" Wing Uses Boundary Suction

Design of thick airfoil is initially evaluated in glider application.

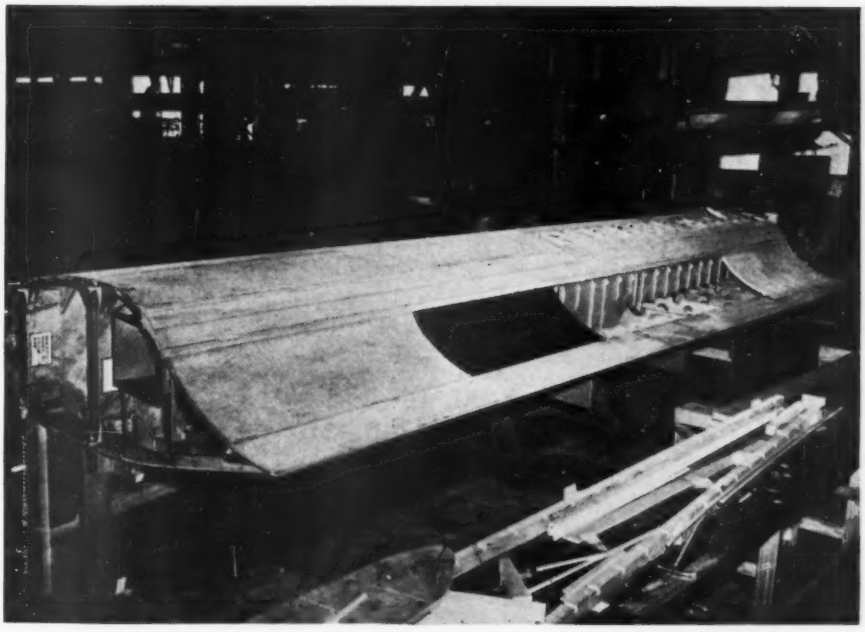
Australia's new "tadpole" wing, incorporating the principles of boundary layer control, is reported to have proved successful in recent flight tests.

This novel airfoil featuring wood construction, was developed by the Australian Council for Scientific and Industrial Research in association with engineers of the Government aircraft construction plant at Fisherman's Bend, near Melbourne.

► **On Glider**—As a prelude to contemplated application to powered aircraft, the wing was tested on a standard de Havilland DH G2 six-passenger glider with its fuselage modified to accommodate a suction plant and instrumentation. Suction plant comprised a centrifugal fan powered by a Ford V-8 engine.

A series of suction slots is located at the base of the first curve at the top of the wing, at a point where the laminar flow of passing air would normally break away from the airfoil.

Theoretically, this air is sucked inside the wing to eliminate the breaking effect, and it is believed that it can be ejected in such a manner as to provide a propelling force.



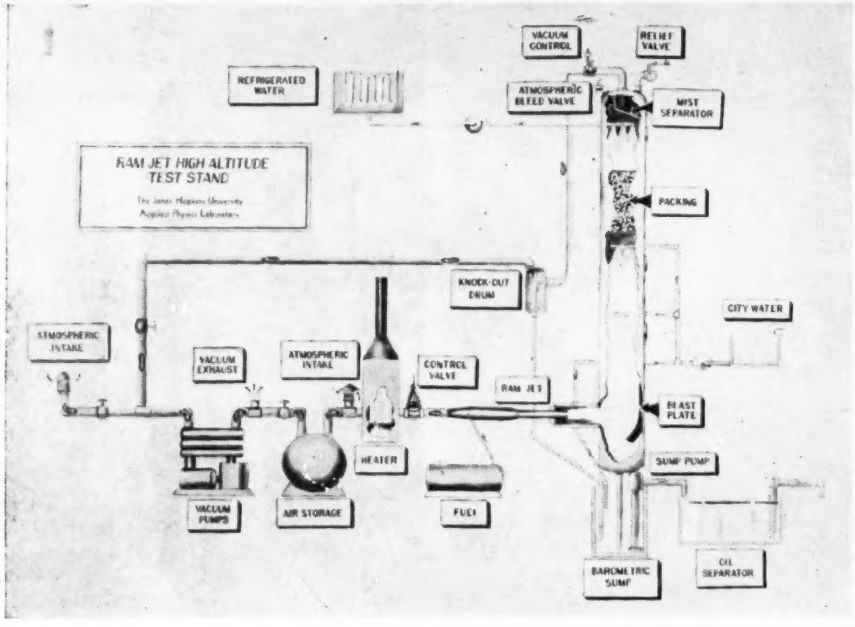
Closeup of center section emphasizes wing thickness. Trailing edge has removable doors.

► **All-Wing Application**—One consideration underlying the wing design is that it should prove particularly suitable for all-wing aircraft, since the wing thickness would lend itself for housing passengers and crew. Applied to a craft of the DC-4 type, the tadpole wing would have a thickness of about 6 ft.

Design of the airfoil is based on theory which was advanced by Dr. A. G. Griffith, English aerodynamicist.

Research and construction on the wing has been in progress in Australia since early in 1947.

Prior to experimental application on the glider, wind tunnel testing was conducted which indicated that the airfoil should possess important advantages over the conventional type wing in a number of uses.



New Ramjet Test Stand Operating

An important component in a guided missile research program sponsored by the Navy Department has been put into operation at the Applied Physics Laboratory of Johns Hopkins University, Silver Spring, Md.

It is a ramjet engine test stand for simulating flight conditions from sea level to 60,000 ft. Built by Chemical Plants division of Blaw-Knox Co., the installation embodies a cooling tower 60 ft. high and 6½ ft. in diameter.

Air supply is taken from pressure tanks or the atmosphere, and passes through a heater and control valve to the ram jet section where it is mixed with fuel. Hot gases from combustion are exhausted into a water-jacketed chamber at the base of the cooling tower.

A battery of windows in the chamber permit observation of the ramjet exhaust. Flowing at high speed into the cooling tower, the gases are sprayed at three points to reduce temperature to enable handling by vacuum pumps.

Topmost spray is refrigerated water. A series of ceramic rings in the upper third of the tower also facilitates cooling of the exhaust.

Cooled gases are drawn off at the top of the tower and discharged into the atmosphere.

Water spray runs off through a barometric leg to a 40-ft.-deep sump.

The test facility is provided with a number of safety cutoffs. If temperature rises beyond a safe limit, air and fuel are automatically shut off. Overflow of the sump also automatically shuts off the burner.

Operated by a small crew of technicians, the facility will provide an economical means of obtaining ramjet performance data which otherwise could be gained only from costly flight tests.

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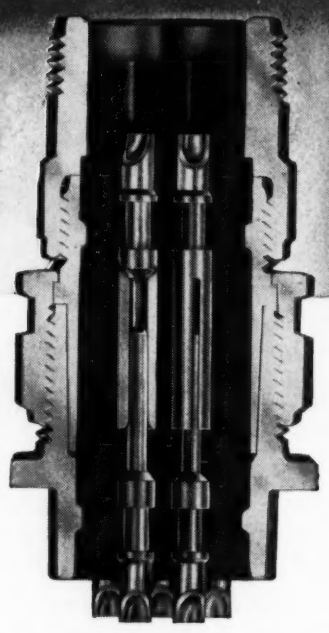

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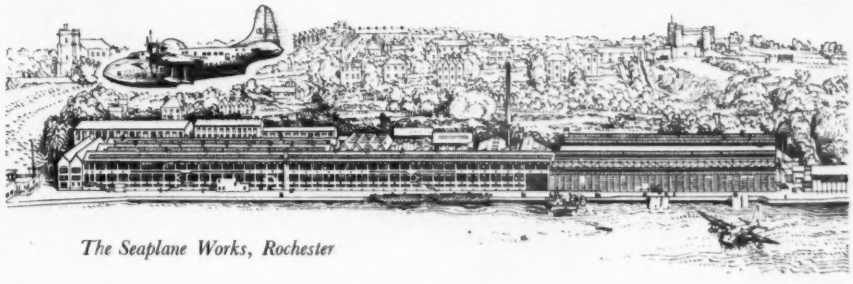


The Seaplane Works, Rochester

Farewell to Seaplane Works

On Thursday, 8th April 1948, a Solent flying boat was lowered down the slip into the Medway. This was an historic incident, in that this Solent was the last aircraft to be constructed in and launched from Seaplane Works, Rochester, after thirty-three years of the factory's existence.

Early Days

It all began in 1915, when the firm of Short Brothers, already established as the first manufacturers of aircraft in the world, became interested in the design and construction of seaplanes for the R.N.A.S.

One of the first types of seaplane to make its appearance was the famous "Two-two-five," the first seaplane to be designed specifically for carrying a torpedo.

Gas-bag Experiment

Among the first jobs to be tackled at the new works was the suspension of an aircraft beneath a streamlined gas-bag. The idea was that the aircraft hung there until the motors of an enemy airship were heard, whereupon the gas-bag was slipped and the enemy aircraft intercepted.

Another historic type was the *Silver Streak*. This was an all-metal biplane, conceived as early as 1919; and was the first aircraft in the world to employ stressed-skin construction. The production of this aircraft was a prophecy of a design trend many years before it became accepted practice.

1916, the Short 225 torpedo-bomber

1924-1934, ten years of flying-boat progress

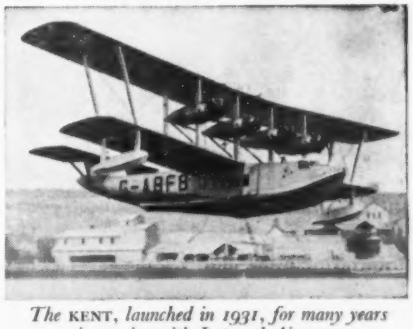
The first venture of Shorts into the flying-boat field was in 1918, with the "*F3*"—a biplane. In 1924 the *Cockle*, a small flying boat with twin Blackburn motor-cycle engines, was launched. This was the world's first all-metal flying boat.

Later came the *Singapore I* (1926), the *Calcutta* (1928), the *Sarafand* (1932), the *Kent* (1931), and the *Singapore III* (1934).

1924, the COCKLE *flying boat*

Rochester to Belfast

It was in connection with the Empire boats that Seaplane Works became best known. From the Empire class came the "G" Class, the Short "Mayo" composite, the Sunderland,

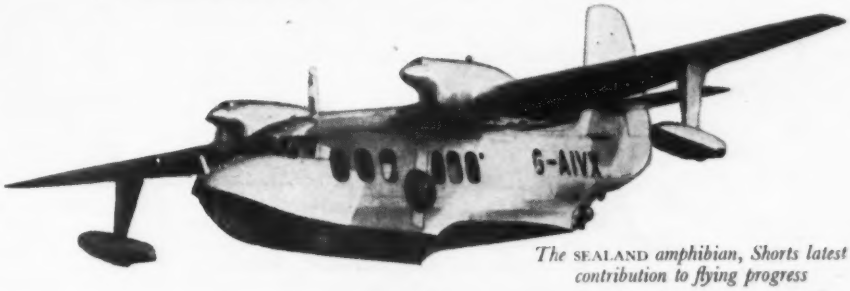


The KENT, *launched in 1931, for many years in service with Imperial Airways*

and now, the Sandringham, the Shetland, the Solents.

With the removal of the works to Belfast, work on designs for progress, plans for the future of the flying boat all over the world, have proceeded smoothly.

The first Sealands are being produced now—the amphibian designed for all purposes. The Solents are mainly on the South Africa route. The Shetland has also been launched, and shows the mighty power the flying boat could be for any purpose.



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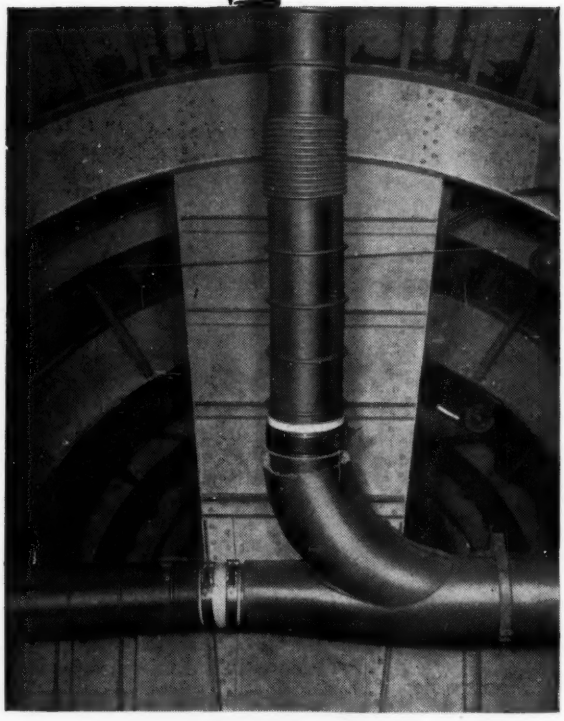

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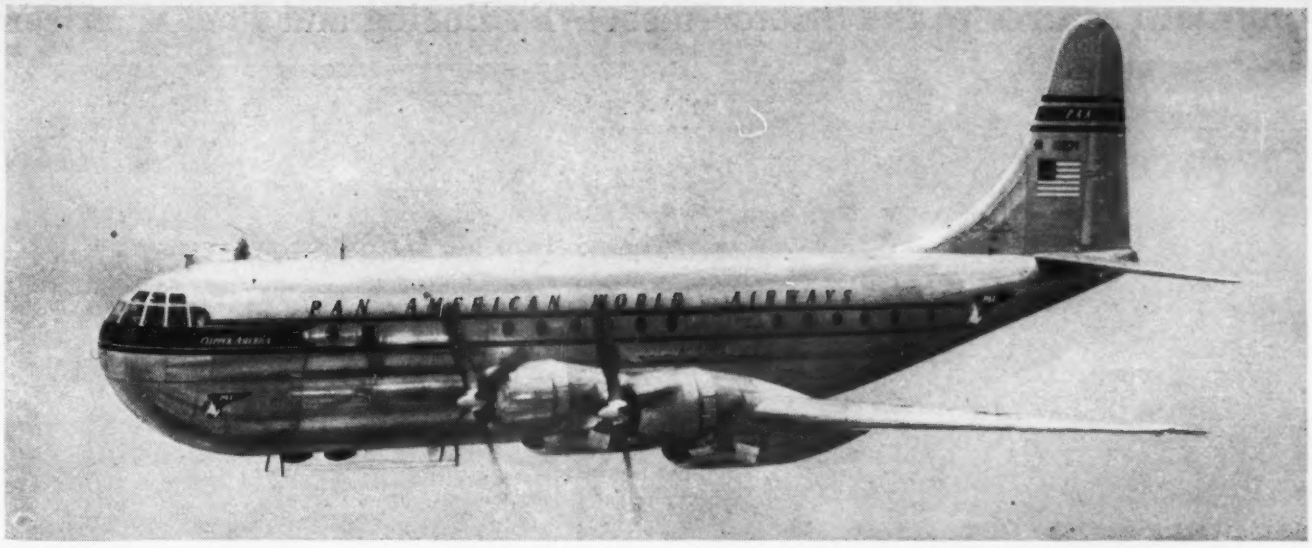


Development of the Stratocruiser

How new transport stems from partnership of manufacturer and airline customer is shown by Boeing, PAA relationship.

First delivery to an airline of Boeing Airplane Co.'s Stratocruiser, largest and fastest of the commercial transports, will be made shortly. The plane represents the best engineering possible by the manufacturer—and by customer airlines. What is an airline's role in development of a new transport? Though not the whole story of the development of the Stratocruiser, the following article, based on material furnished by Pan American Airways, described the important and hitherto unrecognized role of an airline in the engineering of a new transport.

Manufacturers are experts at producing airplanes. They are not expected to be experts at operating those airplanes in commercial service. A U. S. airline's purchase of an airplane usually involves four or five years of the closest possible relationship with the manufacturer in the planning of the airplane from the original specification, through the blueprints, up through the manufacturing process to the delivery date.

In the development of a new airplane, one and sometimes two airlines take a leading part. The airline taking this position of leadership usually is the first to order the plane. This is the airline on which the manufacturer tries out his pet ideas and whose own ideas have most weight as the plane develops. Afterwards, as other airlines come into the picture, their suggestions are considered. In the case of the Boeing Stratocruiser, after the last customer had signed for the airplane a committee of airline representatives was set up to discuss all proposed changes.

► **PAA Example**—Pan American Airways, the first to order the Stratocruiser, assumed leadership in the adaptation of this airplane to airline use. The extent and type of airline contributions to a new airliner are illustrated through the relationship of Boeing Airplane Co. and PAA during the period from the early negotiations of the contract to the final delivery.

The partnership between manufacturer and customer in the airline industry, so typical of U. S. industrial technique, is not new. The process began with the airline industry, and developed strongly in the 1930s.

In the domestic field in the early and middle '30s, first Boeing then Douglas met the need for a dependable work horse of the short haul local traffic. Boeing produced the 247, Douglas the DC-2 and DC-3. In the international field one company with extraordinary needs continually pressed for an airplane entirely different from that operated by the domestics. This company—Pan American Airways—wanted four-engined flying boats for its over-water hops. It got such equipment—first the Sikorsky S-42, then the Martin M-130s and finally the Boeing 314s, each one an advance over its predecessors. It operated such equipment ten years before four-engined airplanes were in general use on the domestic airlines.

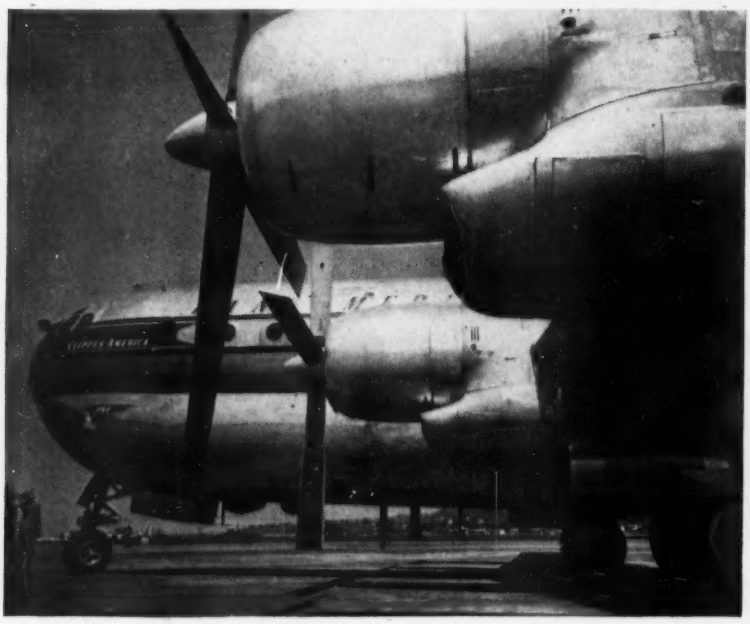
► **Next Step**—With the Boeing 314 still the wonder of its time, Pan American top management began thinking of the next step. Already on the drawing boards and in some cases in production were the Boeing Stratoliner, the Douglas DC-4 and the Lockheed Constellation. The Boeing, the first pressurized four-engined landplane ordered by any airline, represented a significant shift in PAA thinking. The company had previously operated flying boats on its long-range routes. These three airplanes were certain to be the useful workhorses of the war and the period immediately following the war. But beyond these, what next?

Juan Trippe, President of Pan American, A. A. Priester, Vice President and Chief Engineer, Franklin Gledhill, Vice President—Procurement, began making studies and drawing up performance requirements. By January, 1941, the new specifications were being circulated to the major aircraft manufacturing companies. These specifications called for an airplane capable of carrying a 17,500 pound payload for 5000 miles at 375 miles per hour.

With the original 1941 specification a goal, Pan American between 1941 and Nov., 1945, examined closely plans of all major manufacturers for postwar airplanes and even entered into contracts with some of them in the hope the product offered could be improved.

But the best compromise of (1) availability (2) quick delivery (3) price (4) speed and (5) payload turned out to be the commercial development of the Boeing C-97 which was built at the

Unusual Features of the Stratocruiser—By Boeing and Pan American Ai



PROPELLERS: These square-tipped Hamilton Standard propellers were specified by PAA to get better performance from plane.

CABIN: Boeing's figure-eight shape of the plane makes the upper k or the roomiest passenger compartments ever devised.

request of the Army Air Forces early in 1943. Active negotiations with Boeing began in June 1944 for an airplane based on the C-97.

► **Incubation**—To the manufacturer, an airplane is primarily the fuselage, wings, control surfaces and inside installations. And when a manufacturer proposes an airplane to a customer, it is primarily this he is proposing.

But the airline executive has, in a sense, a layman's view. The airplane to him is always the completed flying machine with which he hopes to fulfill his responsibilities to the traveling, shipping and letter-writing public.

Consequently, the period of contract negotiations, with the airline considering the airplane as a whole, is the most important in the history of any new aircraft. The manufacturer, with nothing in production, offers his engineering skill in design, his production facilities and his record of competence. The airline must commit large sums of money as down payments in what is an act of faith that the unborn airplane will justify itself.

In the case of the Stratocruiser and PAA, following an extended period of negotiations a down payment of more than $6 million was required, 25 percent of the total contract. More than $7 million actually was paid before the first airplane was delivered.

The relationship between the manufacturer and the airline develops almost immediately into a partnership.

The partnership of the two companies is well illustrated by the specification changes. In June 1944, Boeing proposed an airplane with 2200-hp. engines, 5700 gal. fuel capacity, 120,000 lb. gross weight and a speed of 280 mph.

This was a first class airplane of which Boeing could be proud, but with a postwar fight for traffic in mind Pan American asked Boeing if it were possible to increase the speed and add to the payload by substituting Pratt & Whitney 3500 hp. engines. Pan American further asked if there were room in the airplane for more fuel which would give the airplane more range.

► **First Changes**—Boeing already had been planning to install the new engines in the B-50 bomber and they found it was possible to use them in the Stratocruiser. The new specification also showed that more than 1200 gal. of gasoline could be added, mainly in wing tanks, and that the engine change would allow the airplane to achieve a gross weight of 130,000 pounds.

Pan American and Boeing discussed this specification and again Pan American asked for changes, primarily changes that would push the range of the airplane up. In the new specification, dated Nov. 25, 1944, space for an extra 120 gal. of gasoline was made available. This was helpful, but the discussions were by no means at an end.

Here the monitoring function of the airline's engineering department entered the picture. The department, or the part of it operating at top management level in the airline, is usually small in size. It exists primarily to do long range planning and to survey and assess the capabilities of manufacturers connected with the airline industry. This may lead it far afield from the airplane manufacturer. Almost every component of the airplane must be checked to see whether some supplier somewhere cannot provide a product that would make the airplane more efficient.

The engineering department's survey of suppliers connected with the airline industry paid off at this time. The original Boeing specification recommended the installation of a mechanical supercharger for the engines. Boeing felt that this would be less complicated for airline use than the turbosupercharger it had installed in the B-17s and B-29s. PAA, however, knew of the highly successful turbosuperchargers developed by the General Electric Co. of Schenectady, N. Y., and of Boeing's success in installing them in long-range bombers. The airline had had some experience itself with turbosuperchargers on the transport version of the Consolidated B-24s it had flown under Army contract and was aware of the tremendous savings in fuel that result from use of turbos in high altitude flight. The turbosupercharging system was incorporated in a specification of Jan. 4, 1945.

The next specification change, Mar. 23, upped the cargo capacity from 675 to 910 cu. ft. Cargo was a business that had barely developed before the war but during the war reached huge proportions. Pan American, as the largest commercial contractor for the Army, had developed a life line to supply the China-Burma-India theater of war. Watching this supply line, Pan American executives saw the possibilities of air cargo in peace time.

► **Better Performance**—Although a great deal had been done to the airplane to

he upper k one of

COCKPIT: Chiefly PAA's idea, cockpit is built around flight engineer station and stresses importance of the third crew member.

STAIRWAY: A Boeing feature from two-deck design, stairway gives passengers more room to move around.

GALLEY: PAA made time and motion studies of meal preparation before specifying this galley from which 61 passengers are served.

LADIES LOUNGE: Another joint development, the "powder room" is dominated by mirrors. It is on upper deck, forward of cabin.

improve it as a tool in the postwar competitive picture, Pan American still wondered what more could be done, and asked Boeing for a further investigation of methods of improving range and payload. Boeing's investigation disclosed that it could raise fuel capacity from 7055 gal. to 7215 gal. It could push the gross weight up another 5000 lb. to 135,000 lb.

Pan American was still bearish. The last and final specification of November 28, 1945 showed a triumphant increase of another 400 gal. of gasoline. Boeing found it could install a wing tank past the 51-ft. mark on each of the wings.

The negotiations had resulted in almost a different airplane although the outside appearance remained about the same. The teamwork of the Boeing and Pan American engineers had increased the payload 10,000 lb. and the gross weight 15,000, increased the gasoline capacity 2000 gal., upped the top speed 60 mph., from 280 to 340, and added five feet to the tail to improve the plane's maneuverability.

Pan American's fight for more gasoline capacity and more payload grew out of its experience in overseas operations. And the fight did not end with the signing of the contract. The gross weight of the plane now is 142,500 lb.

▶ **Crew Considerations**—Although the questions of speed, payload and range were primary considerations in negotiations of PAA top management with Boeing, there were many other things about the proposed development of the C-97 which, from an airline point of view, needed changing. Typical of these was the cockpit. The cockpit layout first proposed was similar in its main essentials to that found adequate by the Air Forces for the C-97.

Pan American engineers believed that consulting the operating pilots of the airline was a sensible way of approaching the cockpit problem. Pilots in the company's employ have flown every type of airplane ever built for airline use as well as many types which never saw commercial service. The C-97 cockpit went to them for approval.

Crux of the problem was the facilities provided for the third crew member, the flight engineer. The three-man crew

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originated with PAA in 1929 when a mechanic was added to the flight personnel to maintain engines at stops en route where adequate mechanical facilities were not available. By 1935, the mechanic had developed into a full fledged flight engineer.

For PAA's long-range operations, it was felt that the C-97 as outfitted for military use did not permit full utilization of the flight engineer.

▶ **Hand-Made**—Boeing assigned carpenters to a group of Boeing and PAA engineers and PAA pilots and suggested that they take over a corner of the Boeing plant and mockup the cockpit to suit themselves. For three days the carpenters built exact-size mockups of positions for the pilot, co-pilot and flight engineer within a replica of the cockpit.

The engineers and the pilots moved the various pieces around the floor until the relationship satisfied everybody. A cockpit had never been laid out in this manner before and what developed out of it has been adopted not only by Pan American but also by the Military Air Transport Service for its Stratocruisers and by certain of the other airlines purchasing the aircraft.

The major advantages of the Stratocruiser cockpit layout are: the flight engineer relieves the pilot of as many extra duties as possible so that the pilot's entire attention can be devoted to his ultimate responsibility of flying the airplane safely; the actual flight panel is simplified as far as possible; the pilot can police the work of the engineer and if desirable take over his job without moving from his position; any one of the three crew members can leave his seat in flight without interfering with the safe operation of the airplane.

Turning his head, the pilot can inspect any instrument given to the flight engineer. Although the flight engineer can set power controls from a duplicate set of levers, the pilot, because his levers are longer and therefore can exert more force, can take away the power controls from the flight engineer at a second's notice. This means that, although responsibility is delegated to the engineer under the supervision of the captain, it is not irretrievably given away.

▶ **Pilot Aid**—PAA engineers pressed for simplification of functions in the new cockpit. On some airplanes, important controls are placed on both the right and the left of the pilot so that occasionally he must switch hands on the control column to adjust the devices. Pan American pilots insisted that all major controls be within easy reach of the right hand of the pilot and left hand of the co-pilot.

Radio communications controls were shifted from the left to the right of the pilot. Navigation light, heater and flare release controls also were shifted and some other instruments were changed. During the entire flight, the pilot need not take his hand off the control column.

This advance in cockpit layout is entirely due to the participation of airline pilots in the planning of the cockpit. It is precisely the kind of contribution that an airline is better equipped to make than the airplane manufacturer.

Having made the suggestions in principle for the layout of the instruments and the control devices and for the layout of the positions of the crew, Pan American relied on the highly competent Boeing engineering staff to work out the design details and to build the actual cockpit. The result is a spectacular advance over other airplane "front offices." On the flight panel, which the pilot must watch at all times, there are fewer instruments to concentrate on than on a DC-3 flight panel.

▶ **Other Changes**—There were other contributions by PAA, both before the contract was signed and afterwards—many of them minor in their significance—which reflected an airline's experience rather than a manufacturer's.

The oil system is an example. The original Boeing proposition showed 50-gal. oil tanks serving each engine with lubricating oil. Reaching back 12 years to its experience with the Sikorsky flying boats, Pan American suggested that the oil tanks be smaller, that a 50-gal. center tank be installed in the fuselage and that a system be devised so that oil could be pumped from the central tank to any other. The center tank would be reserve oil, PAA argued. If one engine started using too much oil, its tank could be replenished.

The system had another virtue. Airplanes do not make money while they are on the ground. Pan American saw a way in which this system could speed up ground servicing. Just before the plane lands from a trip, the flight engineer will pump oil from the reserve tank out to fill the engine tanks. When the plane lands, the refueling crew needs to fill only the center tank. Another virtue was that smaller oil tanks at the engines mean more working space for the mechanics checking and maintaining the engines. The new oil system meant an over-all weight saving of 250-300 lb.—more than the weight of one passenger.

▶ **After the Mockup**—There were two distinct phases of airline manufacturer cooperation following the signing of the contract. The first was during the building of the mockup. The mockup inspection was in Feb., 1946. Following this was the inspection of the first completed airplane which was produced early in 1947. During this time, there were numerous further relatively minor changes. A good example of this sort of partnership was the PAA suggestion that Boeing design a special gang switch for use in a fire emergency.

The idea was first suggested by Lockheed and PAA for the Lockheed Constitution. In case of fire on any particular engine, this one switch will feather the propeller, shut off the fuel oil and hydraulic fluid supply, shut off the air turbo bleed for cabin supercharging and ready the CO_2 extinguisher all in one motion. Previously, separate switches had to be operated.

In addition, PAA asked Boeing if it were possible to design the electrical circuits for the flight instruments so that each instrument would have a fuse and the failure of one instrument would not mean the failure of all.

Coming back to the persistent question of payload, Pan American suggested one further major change, the propeller. PAA was aware that a new propeller was available from the Hamilton Standard division of United Aircraft Corp. and that this would save nearly 600 lb. in weight, or the equivalent of more than three passengers. PAA insisted on the change, although new propellers for 20 airplanes cost an additional half a million dollars.

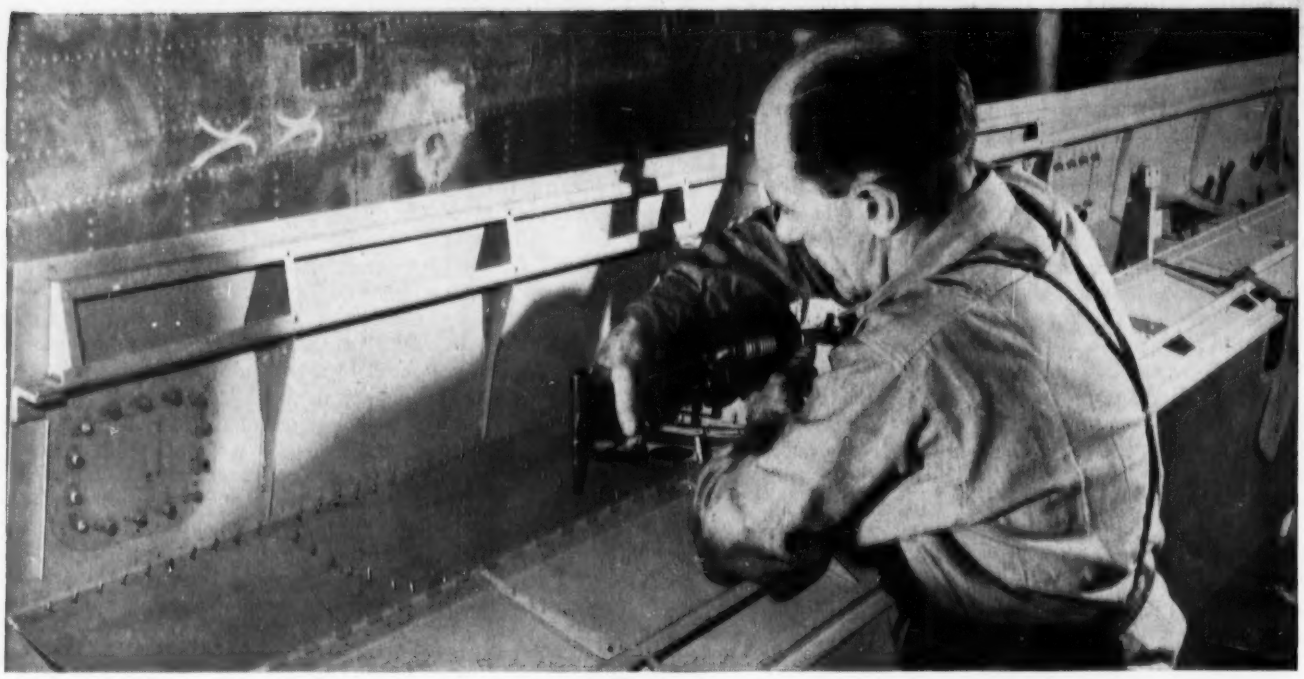
▶ **Batteries and Yawmeters**—There were many other detailed revisions. Added together, the "change orders" fill a book an inch thick. They range from simple things like insisting on a battery above the water line of the airplane in case of ditching in the sea to a request for a yawmeter.

Surveying the work of related manufacturers, PAA noted a number of new developments which it wanted installed on the Clipper America. PAA and the Sperry Gyroscope Co. had developed a device which could analyze engines in flight and forecast and locate troubles. PAA purchased the "engine analyzer" independently after extensive testing on a Constellation. Boeing is installing a unit in each of the 20 airplanes.

Boeing first proposed the standard astrodome for the navigator. However, PAA had encouraged the Kollsman Company to develop a periscopic sextant and this was specified for PAA airplanes.

▶ **Three Years and $200,000**—Altogether, during the three-year period while Pan American maintained a full-time resident staff at the factory, the company spent $200,000 independently in research and salaries of engineers, pilots and maintenance men who contributed to the development of the Clipper America. This expenditure is entirely separate from the large cost involved in introducing a new airplane to the fleet.

Pan American took a leading role in the development of the "377" because it was the first contractor. And as the largest contractor for the "377," with twice as many planes on order as any other airline, Pan American obviously had the largest responsibility.



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Pilot "Bed" Developed For Prone Position

Major objection to the prone pilot position—discomfort—may be overcome by the use of a newly developed "bed" made of Nylon and molded to fit the pilot's figure.

Test "pilots" have spent 8 hr. in the new bed without discomfort, and even 12-hr. tests have not revealed serious fatigue.

▶ **Benefits Derived**—The prone position has long offered two important advantages for high-speed flight—drag of the airplane can be greatly reduced, particularly in all-wing type aircraft; and the human body when prone, can withstand the imposition of considerably more force.

The U.S. has already tested one prone-pilot fighter, the Northrop XF-79B, and studied dozens of other designs based on the location of the pilot and crew members flat on their anteriors.

In the prone position, the pilot has lain on hard surfaces, his chin on a padded leather rest. It was to answer this objection that the Aero Medical Laboratory, Air Materiel Command, developed the new Nylon bed, which is designed to provide both comfort and effectiveness.

▶ **Bed Details**—The bed was designed on the basis of anthropometric studies of body dimensions and required motions in the control of a plane. It is actually a hammock fitted to a frame approximating the curves of the human body.

The body rests at an angle of about 30 deg., rather than in a true (and uncomfortable) prone position, with the legs from the knee to the feet positioned at 150 deg.

The use of Nylon was necessitated by the greatly increased force permissible on the pilot.

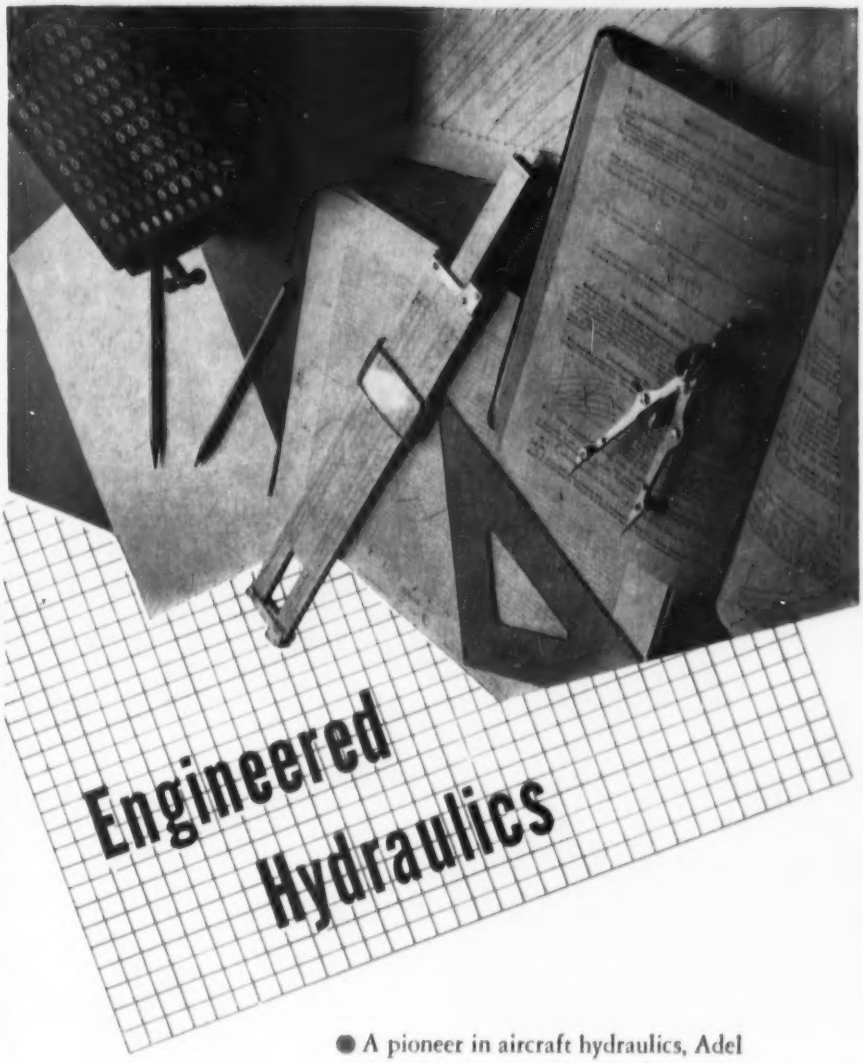
The prone pilot also alleviates the concentration of this force by spreading it out throughout his body, rather than concentrating it on the seat as in conventional position.

▶ **Comfort Afforded**—Pilot's head rests on two chin pads of foam rubber covered with soft chamois.

The arms are accommodated to rest on foam rubber pads in two metal pans at the end of which are grips for aileron, elevator, throttle, flap and other controls.

These grips are mounted on a freely-moving unit which permits up-down, fore-aft and left-right motion, allowing complete control of the airplane by the arms alone.

This feature eliminates need for rudder pedals—another point of criticism about the earlier system.



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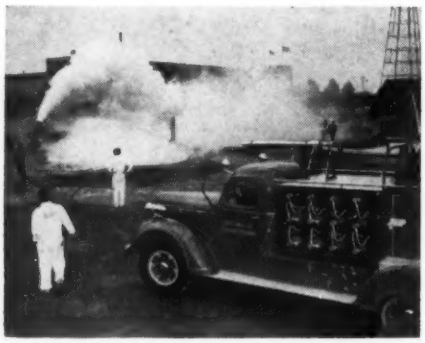
NEW AVIATION PRODUCTS

Gages Fuel Content

Fuel gage system, made by **Aeronautical Div., Minneapolis-Honeywell Regulator Co.**, 2753 Fourth Ave., W., Minneapolis 8, Minn., has been engineered for use in all types of airplanes, including those with integral fuel tanks. Features of gage include: Choice of flange or internally-mounted tank units; low level warning switch, positive in operation and accurate; indicators (available in three dial sizes) with small size dial face to fit crowded panel boards of jet planes; 30 percent weight reduction; and fuel- and moisture-proof submerged cable connectors.



Fire-Fighting Equipment

New 5-ton fire truck, offered by **Walter Kidde & Co.**, Belleville, N. J., is equipped with 12 large CO_2 cylinders connected by hose line to cone-type discharge nozzle claimed largest yet developed. In test, it's reported that equipment extinguished 300-sq. ft. spill fire in less than 1 min., using 300 lb. of CO_2.

Company's other new product is extinguisher that throws stream of fine powder 20 ft. to quickly smother flammable liquid fire by cutting off oxygen supply.

For Aircraft Windows

Liquid glass-cleaner that leaves invisible but fog-resistant surface film after application is announced by **Sax-Kleen Co.**, 11 Bleecker St., Albany 2, N. Y. Known as No-Fog, material is said to produce optical film that gives long protection against fogging and frosting, even under severe conditions. Claim is that light transmission is increased and glass remains clean longer than normally.

High-Heat Bolts and Nuts

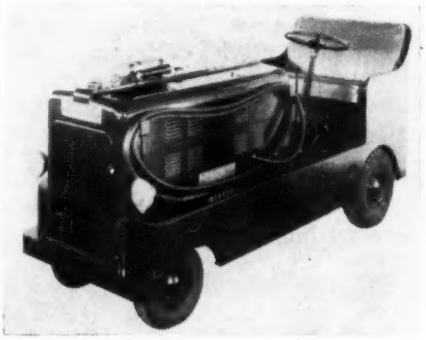
Bolts, nuts, and other types of fasteners stated to offer improved properties for severe service at elevated temperatures in gas turbines and other highly stressed applications are marketed by **Franklin C. Wolfe Co.**, 9014 Wilshire Blvd., Beverly Hills, Calif. Recent tests on bolts and nuts are claimed to have shown these average strengths: Room temperature, 70,000 psi.; minus 111 F., 85,000 psi.; 1500 F., 55,000 psi. Fractures occur in root diameter of bolt thread at interface of nut. Products are resistant to oxidizing and reducing atmosphere up to 2100 F. Units are available for SAE threat sizes in internal wrenching socket head bolts, with or without safety wire holes. Nuts are available in self-locking double 12-point hexagonal. Self-locking plate nuts and special shapes are obtainable in the equivalent to Class 3 fit.

Drill has "Split-Design"

Heavy-duty, pistol-type drill, ¾ in., for aircraft production and maintenance work, is reported to be lightweight unit possessing power to allow continuous operation. Known as "Hole-Shooter," device has split design to enable polishing of commutator and examination of electrical parts during operation. Maker is **Milwaukee Electric Tool Corp.**, 5344 W. State St., Milwaukee 8, Wis.

For Metal Cleaning

Improved Cee-Bee A-3 liquid brightener for aluminum aircraft surfaces has acid content reduced about 70 percent with increased brightening effect. New compound is stated to have unusual free rinsing characteristics even when used in conjunction with hard water. Chromic acid may be added to compound as insurance against acid attack on Alclad, but company reports that laboratory tests have shown that with or without addition of chromic acid, compound has no adverse effect. In addition to its use for brightening by simple dilution with water, material can be used as intermediate wash. Diluted with a recommended solvent it may be used as a degreaser for nacelle areas. Product is offered by **Cee-Bee Chemical Co., Inc.**, Los Angeles, Calif.



Power-Pull Vehicle

Combination towing tractor and ground auxiliary unit is made by **Motor Generator Corp.**, Hobart Square, Troy, Ohio. For use with aircraft having 24v. systems, it supplies power while plane is on the ground, during pre-flight tests, and in engine starting, etc., and can also be used for towing baggage, fluid service, commissary, and other carts as well as light aircraft. Device is rated 600 amp. at 28.5v. continuous, or 750 amp. for 3-min. intermittent duty. It has drawbar pull of 2,000 lb. and level towing capacity of 25 tons on trailers. Generator is driven by a Chrysler IND-7-2, 6-cyl., industrial type at 1800 rpm. when used as a power unit. Control panel assembly for the generator and engine is mounted as a dashboard, accessible through hinged doors. Dimensions are: Width 29 in., length 102 in., height 52 in. Turning radius is 130 in. and maximum speed is 10 mph.

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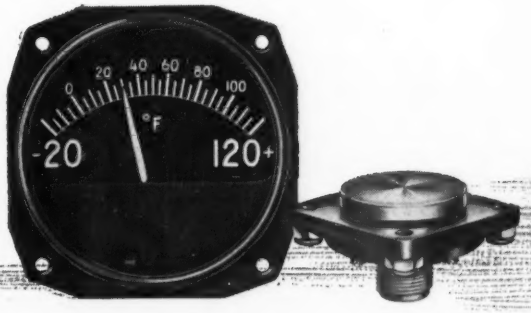

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Market Action

LEADING AIRCRAFT EQUITIES

Company	1946 High	1947 Low	1948 High	Close Nov. 30, 1948
Beech	31	6	15⅛	12⅝
Bell	36	11	19¾	10⅞
Boeing	35	14	29½	19⅞
Convair	34	11	16⅜	8⅞
Curtiss-Wright	12	4	12½	7⅛
Curtiss-Wright "A"	34	13	28¼	20⅛
Douglas	109	45	67⅞	47
Fairchild E & A	8	4	5⅝	4⅛
Grumman	26	9	25¾	17
Lockheed	45	11	24⅝	16½
Martin	46	14	22⅜	9¼
No. American	17	7	13⅜	8¾
Northrop	15	5	13⅞	10⅛
Republic	25	4	13⅜	7¼
United Aircraft	37	17	30⅝	22¼

Notes: All fractions omitted for 1946 and 1947. No adjustments made for cash dividends paid.

Aircraft Stocks Hit Year's Low

Two factors force prices down: general market decline, and fear 1950 procurement funds will be cut.

Aircraft equities were led into new low ground for the year recently along with declining prices for the general market. Apparently the reported plans for the National Military Establishment as envisioned in the presently projected 1950 fiscal budget may have started a new wave of liquidation of aircraft securities.

With the military budget limited to an indicated $15 billion, it is reliably reported that the allocation for the U. S. Air Force would permit only 51 combat groups as opposed to the 70-Group program which has found such widespread support in Congress and throughout the country. Stated in terms of procurement, this proposed reduction would entail a cut of about 30 percent in new orders as compared to the 1949 fiscal period.

With the aircraft industry as a whole having difficulty obtaining sufficient business to provide volume operations for the existing plants, the impact of a drastic curtailment of new orders is obvious.

▶ **No Uniform Effect**—Yet, effects on separate companies can be far from uniform. The highly individualistic aircraft industry has always shown a shifting selective pattern of its very own. There is strong reason to believe this trend will continue.

The accompanying table discloses the market fluctuations of leading aircraft securities over a period of significant milestones. Generally speaking, postwar peaks were established during 1946. This reflected the strong financial conditions built by war orders and the optimistic predictions, in some quarters, of a strong demand for commercial planes.

As backlogs diminished and resources in many instances were dissipated through extraneous ventures, a great deflation took place in the market prices of aircraft shares.

▶ **Upswing**—Then came the President's Air Policy Commission report, followed in March of this year by the Congressional Aviation Policy Board's recommendations. As international conditions deteriorated, greater impetus was given to aircraft appropriations. This sparked a market recovery in aircraft shares which continued well into 1948.

As the relative positions of the separate aircraft companies began to clarify, market adjustments were quickly made in the prices of the individual equities.

But now the general weakness in aircraft shares appears to have hit all aircraft issues.

▶ **Examples**—For example, the purchaser of Douglas at the low point in 1947 is no better off at the present time, the price of the stock now being at about the same level as at that time. By contrast, Beech more than doubled in price from its 1947 low to the Nov. 30, 1948 quotation, and this after a decline from its 1948 peak.

It is significant that in the entire group, only Bell, Convair, and Martin are currently selling below 1947 lows.

In the recovery which developed in 1948, only Curtiss-Wright common surpassed its 1946 peak. However, this market action was due to extraordinary factors resulting from special pressures which dictated a surprise $2.00 per share dividend on this class of stock. As Curtiss-Wright is showing a steady decline in its relative position as an aircraft producer, the main interest on the part of investors and speculators alike is directed toward the company's large cash position and its ultimate disposition.

Grumman Aircraft almost equaled its 1946 peak price during 1948. While the recent decline has taken the price of the stock down about 33 percent from its high of the year, there has been little change in the company's actual position and earnings outlook.

Northrop is another company whose equity earlier this year almost reached its previous peak of 1946. Its shares are off some 27 percent from its pre-election high. Yet, the company is known to have a larger backlog of orders at the present time than it did in 1946.

One of the most disappointing market performers is Convair. The Atlas Corp. management has had control for more than a year and has steadily added to its holdings. Recent reports show that Atlas Corp. owns 307,200 shares of Convair or approximately 27 percent of the total stock outstanding. Despite this buying, Convair shares have been very weak and fell below their 1947 lows.

Martin has shown even greater weakness. The common stock is down some 60 percent from its 1948 high and about 33 percent below its 1947 low.

▶ **Change Possible**—Much has to be done before the 1950 fiscal budget will be enacted. There is always the chance that Congress will not accept the aircraft procurement limitations contained in Secretary Forrestal's budget.

Regardless of the size of the ultimate pie available to the aircraft builders, the distribution of awards will continue to be reflected in the highly selective price pattern of market equities. As general apprehension toward the group as a whole is gradually dissipated, the individual strength of the more favorite aircraft companies will become more apparent. **—Selig Altschul**

Who was *First?*

WHO WAS FIRST to apply the age-old principle used by the Indians in building birch-bark canoes, to the development of "stressed-skin" fuselage construction? *Answer: First smooth "stressed-skin" monocoque fuselage patent was issued to F. E. Loudy in 1926.*

WHO WAS FIRST to apply the natural laws of flight used by birds to develop a scientific approach to the possibilities of human flight? *Answer: Leonardo da Vinci, the famous Italian scientist, is credited with the first study of birds to determine the ratio of wing area to flight load.*

WHO WAS FIRST to apply Newton's third law—"for every action there is an equal and opposite reaction"—to the design and construction of a jet-propelled airplane? *Answer: The first jet-propelled airplane was designed by Campini and flown near Milan, Italy in 1940.*

WHO WAS FIRST to apply the shut-off principle used by the ancient Egyptians for control of water in sluices and irrigation ditches, to the design and construction of a sliding gate shut-off valve for the aircraft industry? *Answer: Wm. R. Whittaker Co., in 1942.*

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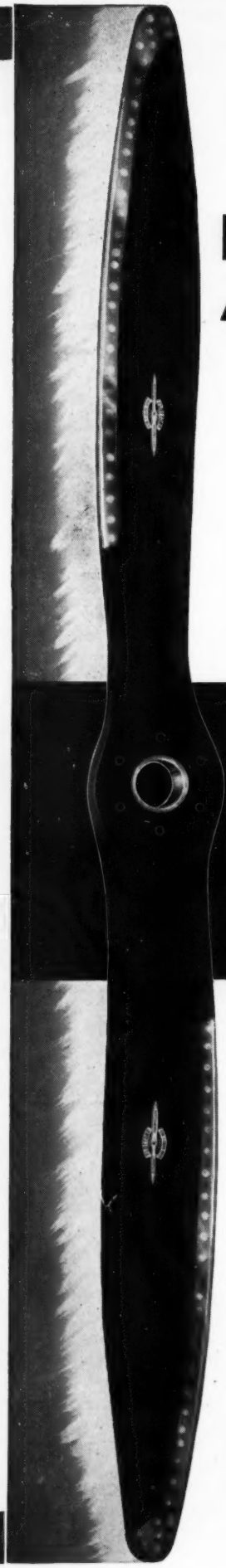

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LETTERS

GCA-ILS Study

In your "Letters" column of the Nov. 8th issue we note with interest a letter titled, "GCA and ILS Problems," written by Captain H. F. X. Hession, USAF. Captain Hession refers to an article by Robert B. Roe and myself (AVIATION WEEK, Aug. 16, 1948) concerning the instability problem encountered in making instrument approaches.

Among the many responses to the article, Captain Hession's was the only one interpreting it as proving that GCA is superior to ILS.

In writing the original piece, it was the authors' intention to discuss only one problem related to low approaches, namely, instability. We indicated by means of flight recordings that approaches below 200 ft. could not be made by the airlines with the necessary high percentage of completions due to lags inherent in the pilot and airplane. Other flight recordings of automatic approaches on ILS indicated that when lags attributable to the pilot were eliminated and anticipation was introduced, approaches below 200 ft. could be consistently made. As confirmed by Captain Hession, data on automatic approaches with GCA will not be available until that system is perfected. It is pertinent to note that application of automatic techniques to GCA have been deemed necessary.

Captain Hession does an admirable job of pointing out the excellent features of GCA. We all know that the airlines have been granted lower minimums through the use of ILS. This leads to the conclusion that we are fortunate in having two instrument approach systems available. Let's use both to the best advantage.

However, building a case for either GCA or ILS played no part in our article. We constantly study existing and future systems and attempt to supply improved instrumentation toward what is the real pay-off—consistent approaches below 200 feet. Our piece in AVIATION WEEK was a report on one phase of this study.

H. C. BOSTWICK
Flight Research Director
Sperry Gyroscope Co.

Persuading Millions to Fly

Your recent editorial series on educating the general public to fly is quite timely.

A few of the airlines are beginning to realize this fact. As soon as all of our airlines and aviation businesses realize the importance of air age education I am sure many of the complaints about business conditions will disappear. I have found that many of the aviation people have to be sold on such a program before they would even cooperate with us in our statewide air age education program. . . .

HAROLD D. WEATHERLY
Aviation Education Consultant
Missouri Div. of Resources and Development

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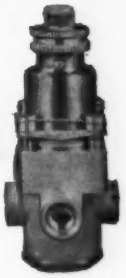
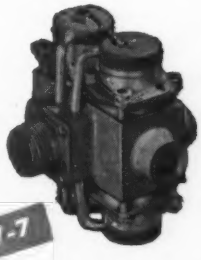
Electric motor valve, suitable for fuel, hydraulic fluid and lubricating oil shut-off. High flows at low pressure drop, explosion-proof motor and switch cover.


AV-11
3-way Electro-Magnetic valve used for distribution of fluid flow or for "feed in" and "exhausting" fluid from a cylinder, piston or vessel.

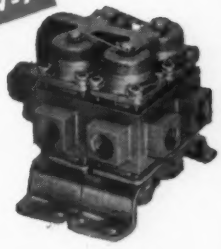
AV-2
Same as AV-1 except is normally open type. For control of various fluids, oil, water, gasoline, air, etc.


AV-7
Four-way selector type control—operating pressure up to 3000 P.S.I. for control of fluid pressure operated cylinders.

AV-9
Electro-Magnetic valve for medium and high pressure applications. Controls hydraulic oils, fuels, lubricating oils, water, etc. 50 P.S.I. to 3000 P.S.I. operating pressure.

TM-11
Temperature modulating control—providing fully automatic electro-hydraulic operation for control of engine coolant and lubricating oil.

AV-1
Normally closed type Electro-Magnetic valve—for control of all types of fluid, gasoline, air, water, hydraulic fluids or oils, anti-icing fluids, etc.


AV-7
Electro-Magnetic Double-Four Way selector type valve for control of fluid pressure operated cylinders.

AV-1
Electro-Magnetic type valves with various magnet sizes, full ported or restricted ports, for all types of fluid, gasoline, air, water, oils, etc.

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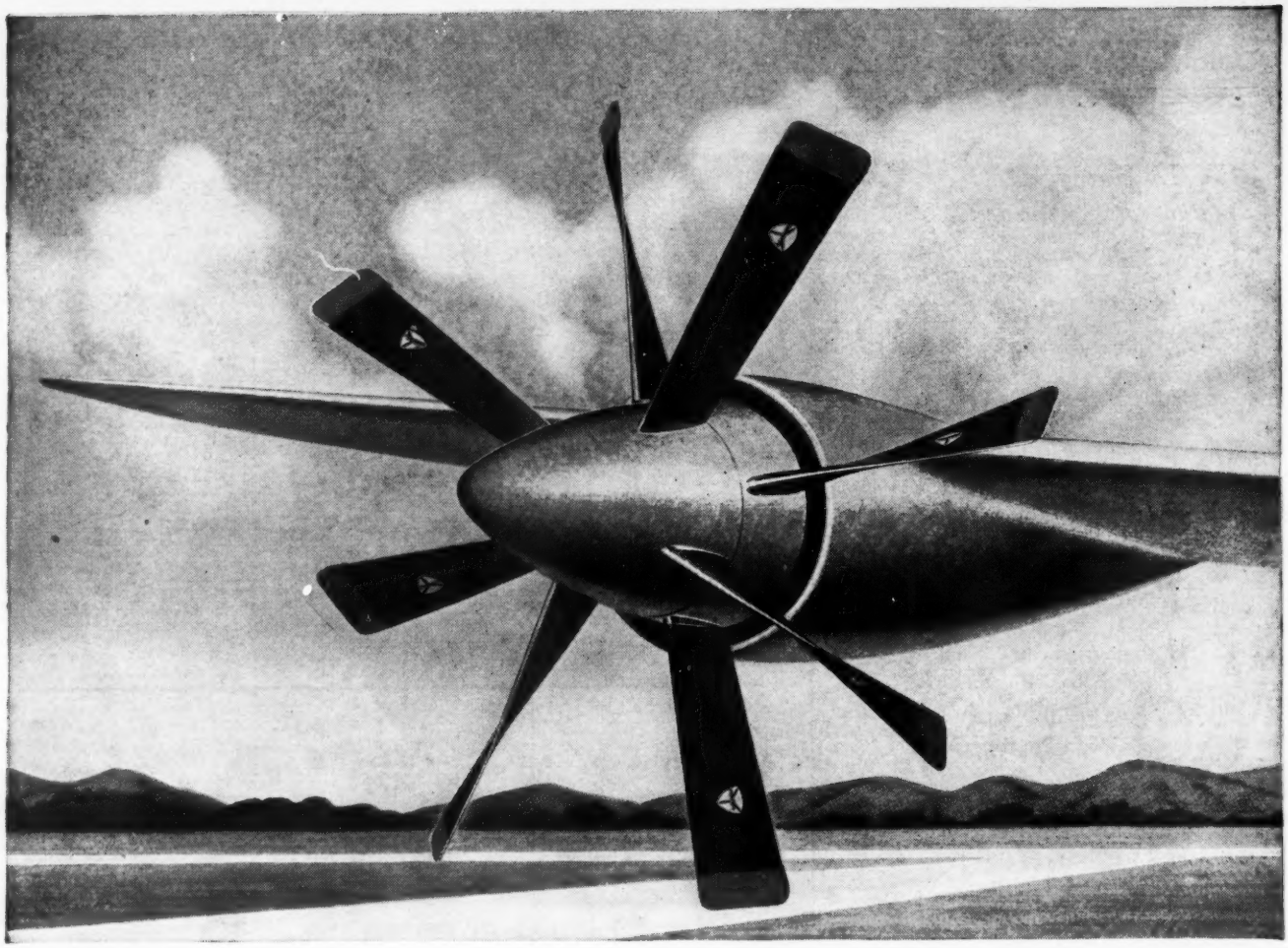

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Aeroprop Duals have already made their name, using the proven principles that have distinguished all Aeroproducts propellers. Functionally, the unit is unchanged, using the same self-contained hydraulic system, the same hollow hub, the same regulator and governor—all features of added value in Dual construction. The Aeroprop Electronic Control provides the precise speed control so necessary for turbo-prop combinations—with the added safety feature that the integral hydraulic controls continue to function in event of electric power failure.

Aeroprop built the first production Duals, which proved themselves on many applications. Today's Duals—tested, proved and improved through years of research—prove again that tomorrow's aircraft problems can be met today at Aeroproducts.

The Aeroprop is available in single or dual-rotation with instant-feathering, reverse pitch, electric de-icing, and all other features required for any installation. Regulator, hub and blade assemblies are designed for unit installation or replacement. It is strong, light and simple.

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Plane Proven as Farm Implement

Flying Farmers hear government reports on spraying; Fred Lee asks group for code of operating standards.

High profit margin is causing expanding utilization of airplanes and helicopters as farm implements, recent government reports indicate.

Department of Agriculture preliminary reports for the 1948 season showed farmers in the U. S. and Canada used about 10,000,000 lb. of 2,4-D weed killer, or approximately double the amount used in 1947 and five times the amount used in 1946. While some of this chemical was not applied from the air, it is a fair assumption that more than half was so applied.

Fred Lee, deputy CAA administrator, speaking before a Chicago conference of the National Flying Farmers Assn., reported that in Iowa approximately one million acres of corn were treated with 2,4-D. In Kansas 500,000 acres of wheat were treated, and in nine midwestern states, heart of the country's grain production, 23 percent of the farmers applied 2,4-D.

► **Recommendations**—Warning about dangers of local restrictions on aerial spraying and dusting because of improper use of the chemicals, Lee cited recommendations prescribed by George Childress, head of the CAA agricultural flying section, and L. S. Evans, Department of Agriculture agronomist, that were developed from a recent survey through cotton areas which have been damaged by improper spraying.

Recommendations:

- Closer supervision by CAA on aircraft and operators dispersing 2,4-D.
- Limit waivers for spraying to operation of specific aircraft inspected and approved for this type of operation.
- Aircraft used must have a positive cutoff valve between tank and spray-boom and also at the nozzles. There should be no leakage.
- Use of esters of 2,4-D should be prohibited in areas where susceptible plants are cultivated.
- Operational requirements concerning relation of wind velocity, distances from sensitive plants, altitudes and operation of cutoffs.

It is pointed out that major difficulty thus far has been with use of 2,4-D dust scattered from planes, since the drift is difficult to calculate. Use of 2,4-D dusting has been prohibited by CAA.

Use of liquid 2,4-D in ester form is the most effective, yet volatility of the ester makes it dangerous to neighboring sensitive crops. Use of the non-alcoholic amine form 2,4-D, much less volatile, but likewise less effective than the ester form, is preferred for airplane spraying when there is hazard to neighboring crops.

► **Case Cited**—Case is reported by Lee of a judgment of $3300 against the Chapman Chemical Co., Memphis, by an Arkansas court as a result of rice spraying which allegedly damaged adjacent cotton crops in 1947. Defendant company appealed after judgment ignored testimony that average cotton yield on the complainants' farm was higher in 1947 than in previous years. The testimony was cited to discredit the allegation of damages from the aerial spraying.

Active participation by state agricultural colleges in educational programs on aerial spraying and seeding was indicated at the Flying Farmers Chicago conference, with announcement of state college short courses for aerial spraying and fertilizing at University of Minne-

ADMA OFFICERS AND DIRECTORS

At the recent Aviation Distributors and Manufacturers Assn. convention in Cleveland, the men above were elected as officers and directors. Left to right seated: H. Donald Richards, executive secretary; F. W. Krueger, Bendix Products division, South Bend, director; Richard N. Bomberger, Sensenich Corp., Lancaster, Pa., president; G. B. Van Dusen, Van Dusen Aircraft Supplies, Inc., Minneapolis, vice president; H. L. Wheeler, Buffalo Aeronautical Corp., director. Standing: Tom Fernley, advisory secretary, and, Charles Crawford, C. J. Hendry Co., San Francisco; A. M. Recker, Goodyear Tire & Rubber Co. aviation sales, Akron; Charles F. Irons, Snyder Aircraft Corp., Chicago, and Earle M. Scott, Scott Aviation Corp., Lancaster, N. Y., all directors.

sota, Dec. 21-22; University of Illinois, Jan. 12-14; Texas A & M College, Jan. 20-21.

▶ **Code of Standards**—Lee appealed to the Chicago group for voluntary efforts to standardize equipment, and to develop a code of operating standards for commercial spray operators which would forestall need for local or federal regulations limiting this new field of aircraft utility.

Representatives of chemical manufacturing companies, commercial dusting and spraying operators, aircraft manufacturers, agricultural colleges, insurance interests, spraying equipment manufacturers, and CAA and state aviation officials attended the session along with farmers who own their own airplanes and indicated a desire to use them for spraying, seeding, fertilizing, etc., with a minimum of restriction from either state or federal agencies.

Copter Sales Report Shows Limited Utility

Indication that the helicopter is still a long way from use as a personal aircraft is found in the recent report of Bell Aircraft Corp., on the export sales of 45 helicopters.

None was sold to private owners for personal use. All Bell helicopters now abroad are being used for industrial or military operations.

Of 45 commercial Bell helicopter sales abroad, Argentina has bought 19; Canada, eight; Sweden, five; Brazil, four; England, three; Mexico, three; Iraq, two; and Columbia, one. A substantial number of other foreign sales is pending.

Of the Argentine helicopters, 13 have gone to Trabajos Aereos Representacion ES, S.A., and have been used principally in combating locust plagues and doing other agricultural work. The six remaining craft were purchased by the Argentine Naval Commission.

▶ **Canadian Sales**—Canadian sales (number of craft in parentheses) were made to Hans Lundberg, geophysicist, with headquarters in Toronto, (one); Skyways Services, Ltd, Manitoba, (three); Photographic Survey Co., Ltd., Toronto, (one), and deHavilland Aircraft, Toronto, (three). The latter three craft were for resale since deHavilland is Bell sales agent for Canada.

British European Airways Corp. bought two. Irvin-Bell Helicopter Sales, Ltd., bought one. The Directorate General of Agriculture in Baghdad, Iraq, bought two. Cia. Impulsora Aeronautica Mexicana, S.A., formerly Cia. Aerofumigadora, Mexico City, bought three and is using them for agriculture and other work.

BRIEFING FOR DEALERS & DISTRIBUTORS

TWIN CITIES AIRPORT AGREEMENT—The six-month dispute which has held up expansion of Wold-Chamberlain airport as the major Twin Cities air terminal appears near settlement out of court. DePonti Aviation, fixed base operator on the field, had filed suit asking court review of the Minneapolis-St. Paul metropolitan airports commission order providing for the expansion.

Now, under a proposed agreement, the commission would purchase four DePonti hangars, masonry office buildings and ramp space. DePonti will continue as an operator lessee at the field. The suit will be withdrawn. Commission plans call for acquisition of 1900 acres, building a 6500 ft. NW-SE runway, and extending the N-S runway 615 ft. to a new length of 6500 ft.

DePonti had previously sought to have the commission choose another site for the major terminal so that it could remain the principal fixed base operator at Wold-Chamberlain maintaining a flight school and other activities.

12 SKYTOUR RESORTS—Skytours Inc., recently formed association of vacation and resort spots with airplane landing facilities, lists 12 resorts in its latest brochure. Skytours headquarters is at Box 120, Swarthmore, Pa. Everett J. Wood is president, and Rocco Bunino, operator of Rocco's Villa Sunset, at Lake Susquehanna Airpark, Blairstown, N. J., is board chairman. Other directors are C. M. Washburn, Honeymoon Island, Fla.; Tom Wheeler, Gray Rocks Inn, St. Jovite Airport, Quebec, Canada; Jerome Bates, Sky Lodge, Jackman, Me.; and Col. Jack Lapham, Flying L Ranch, Bandera, Tex.

Other resorts in the group: Air Holiday Inn, Groton, Conn.; Blaney Park Resort and Airport, Mich.; Bradley Field Skytel, Boise, Idaho; Currier's Village, five blocks from Lakeside (Ore.) Skyport; King's Gateway Hotel and Airport, Land O' Lakes, Wis.; Otis Lodge and airport, Lake Sisse-Bak-Wet, Grand Rapids, Minn., and Red's Ranch and Airstrip, Wallowa Mountain, Ore. Organization seeks to recruit flying tourists on an annual membership basis which entitles them to discounts and other privileges at the resorts.

WILL TRY AGAIN—Endurance pilots Bert Simons and Pred Vinmont, who set their Luscombe Sedan down among some trees when a freak engine mishap ended their recent record attempt at Dallas, want to try again next spring.

They were satisfied with the equipment, they said, and would like to use it again. The method of picking up five-gallon gasoline cans at the end of a rope, provided much needed exercise and they were in good condition except for cuts and bruises sustained in the forced landing in the dark. They came within 200 hr. of the existing record of 726 hr.

WHAT PRICE BT-13s—Growing export demand for BT-13s desired by foreign governments may put the noisy war surplus trainers up quite a bit on the used plane market. There was a time not long ago when they were close to a "dime a dozen."

Price of $5000 has been quoted in recent advertising for the Vultee-built basic trainer for export and D. E. Gaare of Gaare Supply Co., Vernon, Tex., reports that he has recently sold a good-sized order of BT-13s and spare parts to the Dominican Republic Air Force.

MORE LIKE JOE—Luscombe Airplane Corp. at Dallas, would like to have more dealers with ideas like Joe Potter, aircraft dealer at Hancock Field, Santa Maria, Calif., who recently placed his first order as Luscombe dealer. He asked for 14 new Luscombes, including two four-place Sedans, eight Sky Pals, the low-priced best seller, two Observers, and one each of the Silvaire Special and Silvaire De Luxe models.

RYAN TAKEOFF AND LANDING—In a recent demonstration Ryan sources report that a standard Navion, picked at random from the production airplanes on hand at San Diego, took off and cleared a 50 ft. obstacle from a standing start in 950 ft. and approached over a 50 ft. obstacle, landed, and came to a full stop in 875 ft. Tests were with full 2750 lb. gross load, zero wind, at sea level. —ALEXANDER McSURELY

The Canadair Four ... sets a new standard of operation with the highest performance at the lowest cost of any four-engined aircraft ever developed. On more than nineteen hundred North Atlantic crossings, Trans-Canada Air Lines have proved the outstanding dependability and economy of aircraft designed and built by Canadair Limited.

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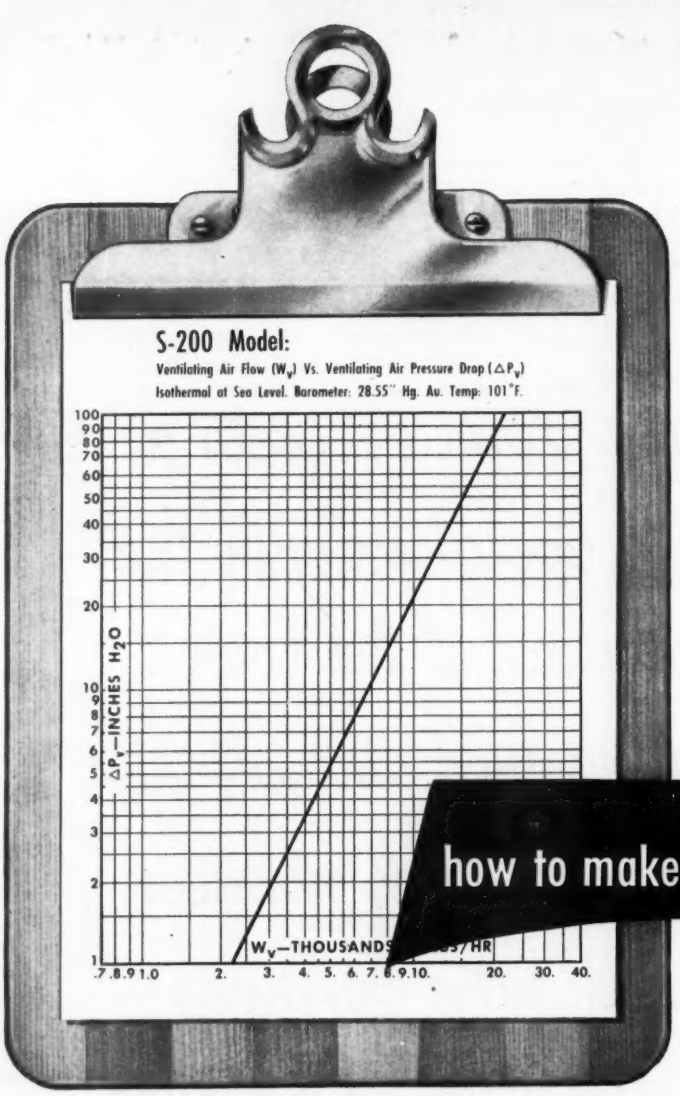
4 LOW VENTILATING AIR PRESSURE DROP

FOURTH IN A SERIES OF MESSAGES ON COMBUSTION TYPE HEATERS FOR THE AIRCRAFT INDUSTRY.


S-200 Model:
Ventilating Air Flow (W_v) Vs. Ventilating Air Pressure Drop (ΔP_v)
Isothermal at Sea Level. Barometer: 28.55" Hg. Au. Temp: 101°F.
ΔP_v—INCHES H_2O
100 90 80 70 60 50 40 30 20 10 9 8 7 6 5 4 3 2 1
.7 .8 .9 1.0 2. 3. 4. 5. 6. 7. 8. 9. 10. 20. 30. 40.
W_v—THOUSANDS

how to make a heating system breathe easily

Select a heater with low ventilating air flow resistance! Check the above chart. It shows ventilating air pressure drop versus air flow for the Model S-200 Janitrol aircraft heater, latest addition to a large, constantly growing line.

Low pressure drop means more air for the plane and greater freedom in selection of ductwork shapes, sizes, and lengths. *You save weight.* You get high performance. In flight, Janitrol heaters use ram air; if ground operation is desired, lightweight blowers and smaller motors serve efficiently and well.

The S-200 illustrates another important feature: with Janitrol's exclusive whirling flame, it delivers 200,000 Btu/hour, yet weighs only 28 pounds. And because you can put Janitrol heaters practically anywhere in the aircraft—for practically any heating requirement—you minimize ductwork, save crucial pounds all along the line.

Whatever your particular problem—for military or commercial aircraft—call on your nearest Janitrol representative for prompt service. The earlier in preliminary design stage, the better.

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Central District Office, Engineering Development and Production, Columbus, Ohio • Headquarters, Toledo, Ohio

Chicago Gets Copter Mail Service

Post Office enthusiasm for project cool because of cost; certification is second of its kind in country.

The nation's second certificated helicopter operation is to be established in Chicago and major suburban communities within a 50-mile radius of Chicago Municipal Airport.

Helicopter Air Service, Inc., Sky Harbor Airport, Northbrook, Ill., was chosen by the Civil Aeronautics Board to conduct the combination mail and property service for five years. Application of Anderson Air Activities, Milwaukee, Wis., to operate the routes was denied.

▶ **Larger Than Los Angeles System**—Certification of HAS for a 305-mile system in the Chicago area followed by about 18 months a similar authorization to Los Angeles Airways. LAA, which started service on Oct. 1, 1947, has a three-year temporary certificate for approximately 200 route miles in the Los Angeles metropolitan area.

CAB established helicopter service in Chicago despite cooling in the Post Office Department's enthusiasm for the project because of its cost. The Board's decision emphasized that further development of the helicopter and the experience to be gained from helicopter operations promote the interest of national defense.

▶ **Military Support Cited**—Both the Air Force and the Navy had urged certification of the Chicago service. They said the operation would build a nucleus of trained helicopter flight, maintenance and engineering personnel as part of an emergency reserve for defense.

The Chicago helicopter service will expedite mail deliveries from 6 to 20 hr. on weekdays and by 40 to 42 hr. on weekends and preholiday periods. As the second largest city in the United States, Chicago is also the second largest generator of air mail.

▶ **Routes Listed**—The three routes authorized by CAB are circular, starting and terminating at Chicago Municipal Airport.

Segment A Includes Berwyn, Oak Park, Park Ridge, Glenview, Evanston, Wilmette-Winnetka, Glencoe, Highland Park, Lake Forest, Waukegan, Libertyville, Barrington, Palatine, Arlington Heights and Des Plaines, Ill.

Segment B Includes La Grange, Maywood, Elmhurst-Villa Park, Glenellyn-Wheaton, West Chicago, Elgin, St. Charles-Geneva, Batavia, Aurora, Naperville, Downers Grove and Hinsdale, Ill.

Segment C Includes Blue Island and Harvey, Ill., Whiting, East Chicago, Gary and Hammond, Ind., Lansing, Chicago Heights, Joliet, Lockport, Lemont and Argo, Ill.

A shuttle link will extend directly from the airport to the Chicago post office building.

Headed by Thomas H. Reidy, Helicopter Air Service was formed for the sole purpose of developing commercial uses of helicopters in Chicago. The company took delivery on a Bell 47-B in April, 1947, and has since used the craft for route surveys, demonstrations, student instruction, power line inspection, exhibition flying and charter work.

HAS plans to operate six Bell helicopters over its routes and estimated its capital requirements at about $350,000. CAB said that the company's mail pay need would probably be about $1.25 a plane mile—the rate now being paid Los Angeles Airways—or a total of $437,500 annually. HAS Bell helicopters would probably have lower operating expense than the larger Sikorsky S-51s used in Los Angeles.

▶ **Post Office Makes Study**—CAB last summer deferred decision on the Chicago helicopter case for 60 days to give the Post Office Department time to make tests with a substitute surface mail transportation system. A subsequent report indicated that nine government-owned trucks could perform a service "approximately equal" to the helicopter operations at an annual overall cost of $74,605.

But CAB found that considerations of broad national interest justify inauguration of the helicopter service on an experimental basis. Besides the military implications, the operation affords an additional opportunity of providing the air transport industry with answers as to the utility and efficiency of a relatively new type of aircraft in scheduled commercial service, the Board declared.

"The recent war and the present trend of events demonstrate that it is of considerable public interest that new types of scheduled air transportation be fostered when circumstances portend a reasonable expectation of success. In many respects, military and commercial fields of air transportation are one, and at present military versions of the helicopter are similar to commercial types."

PAA Sells Boeing 307s

Three Boeing 307 Stratoliners retired from active service 18 months ago by Pan American Airways have been sold to Airline Training, Inc., Homestead, Fla., for use in four-engine flight training of pilots, copilots and flight engineers.

LOS ANGELES AIR SHOW

TWA and other carriers whose planes were inspected by about 100,000 persons during Air Transportation day at Los Angeles Airport last month think they did a top-notch job of "selling futures." About 90 percent of the passengers making sightseeing flights were first riders, and many said they planned to use the airlines in the future as a result of their short hops. TWA Constellations made 10 flights during the day carrying 503 passengers at $2.50 each. All flights were oversold, and would-be customers were turned away. Western Air Lines made six DC-4 trips with 264 passengers. Together with American Airlines, TWA and Western are making the scenic hops a regular Sunday feature at Los Angeles. Picture shows a WAL Convair-Liner (left foreground), a Los Angeles Airways Sikorsky S-51 helicopter (right foreground) and two TWA Constellations and an American DC-4 in the background.

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Patented silver spring design of Edison Resistance Thermometer Bulbs provides maximum heat transfer and fast response. Time constant less than 2 seconds.
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Airlines Will Bid For Service Travel

The certificated airlines will make their first bid next year for an important part of the $80 million worth of travel authorizations issued annually by armed forces transportation officers to military personnel moving inside the U. S. under orders.

Since 1913, the railroads have granted a 10 percent discount to obtain this business, and as a result now handle virtually all of it. Under a current agreement, military transportation officers must designate railroad travel for personnel except where it can be shown definitely that some other method of travel is more satisfactory.

The railroads' arrangement with the armed services providing for their favored status expires next June 30—at the end of the fiscal year. In the past, the armed forces have invited the airlines to give discounts to military personnel traveling under orders, but the offer has never been accepted. Two years ago, the bus lines began granting a 5 percent discount for military travel.

While domestic airlines under normal conditions have tapped a minimum of under-orders military travel, they have, without publicity, handled a number of emergency troop movements involving hundreds of personnel. U. S. international carriers this year will probably handle from 13,000 to 15,000 military personnel and dependents because of inadequate surface transportation.

Tail Structure Failure Cited In Slick C-46 Crash

In-flight failure of the tail structure after the plane passed through extreme turbulence probably caused the crash of a Slick Airways C-46E near Port Columbus Airport, Columbus, O., last May 16.

The accident occurred when the plane was going around for its third attempt to land at Port Columbus. Previously, the flight had radioed: "Advise no one to go into the turbulence we just went through (near Cleveland)." Cleared for the landing, the pilot declared an emergency, stating his rudder was locked and that he would probably have no directional control on the ground.

Civil Aeronautics Board investigators found that the rivets and fuselage skin immediately beneath the vertical fin had failed during flight. Separation of the fuselage skin allowed the vertical fin to rock across its longitudinal axis until the fuselage carry-in structure beneath the fin failed completely, causing loss of control and the subsequent crash. The two crewmen, only occupants of the plane, were killed.

CAB's Bureau of Safety Investigation has no record of other instances of C-46 tail structure failure. But Curtiss-Wright has recommended reinforcement of the skin and fuselage semi-bulkhead frames under the vertical fin, and Slick, one of the principal C-46 operators, has complied with the suggestion.

Robinson Factor High For October Operations

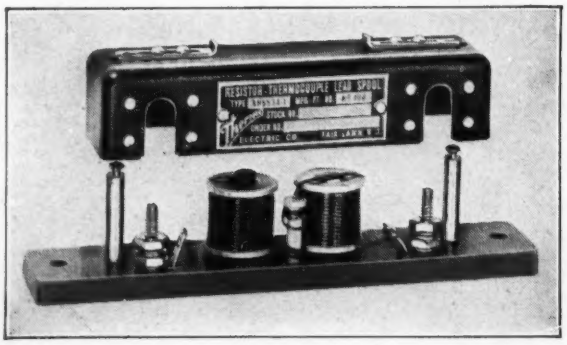
Robinson Airlines, the nation's newest feeder, is making fast progress in building up traffic on its New York state routes.

The company, which began certificated operations Sept. 19, carried 2329 passengers and had a 37 percent passenger load factor during October. This compares with the 30.7 percent average load factor reported by the ten feeder-lines active during all of September.

Highest feeder load factors in September were achieved by West Coast Airlines (45.8 percent) and Southwest Airways (39.2 percent). Lowest were Trans-Texas Airways (15.4 percent) and Florida Airways (23.6 percent).

Robinson carried 12,962 lb. of cargo and 14,240 lb. of mail in October on its link from New York (Teterboro Air Terminal) to Buffalo and Niagara Falls via Binghamton, Ithaca and Rochester.

BALANCING
THERMOCOUPLE CIRCUITS
with ADJUSTABLE RESISTORS



These Constantan Resistors, spool type, are for adjusting resistance of aircraft and engine thermocouple circuits to 8 ohms. Designed to AN specifications.

Our Thermocouples, Wiring Harnesses, Fire Wall Quick Disconnects and Extension Lead Wires are used extensively on turbo and reciprocating engine and aircraft installations. All made of Iron Constantan, Copper Constantan and Chromel Alumel to standard calibrations.

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United Puts Extra Man in Cockpit

But carrier protests necessity of move after scant notice by CAB of new extension past Dec. 1 deadline.

Flight engineers began taking their places as third crew members on DC-6s this month amid a new storm over the ruling which requires an extra man in the cockpit of the Sixes and all other aircraft certificated for more than 80,000 lb. takeoff weight.

United Air Lines was the only one of six DC-6 operators able to meet CAB's Dec. 1 deadline for employing flight engineers and has protested what appears to be a severe penalty for its efforts. Other carriers, which delayed their flight engineer training programs pending an appeal of the CAB ruling, have now been given another two to four months to comply with the regulations.

► **Exemption Protested**—W. A. Patterson, UAL president, said his company had spent $300,000 to train its flight engineers, who will add $1 million annually to payroll costs. "We went ahead with this program last summer because the Board said a flight engineer would be an added safety factor," Patterson declared. "We continued with the project on the positive assurance there would be no change. We learned of the Board's exemption action just four hours before we put flight engineers aboard our planes."

CAB's flight engineer ruling was promulgated last April over bitter industry opposition. The Air Transport Assn. petitioned for repeal of the ruling, but two months ago (AVIATION WEEK, Oct. 18) the Board reaffirmed its decision. CAB had declared it would not grant a blanket extension of the Dec. 1 deadline.

► **Difficult Decision for CAB**—Benefiting from the exemption orders are American Airlines, which operates 50 DC-6s, Braniff with six, Panagra and Delta with five and National with four. American, Delta and Panagra will have until Mar. 31 (at the latest) to complete their engineer training and qualification program, while Braniff has until Feb. 28 and National until Jan. 31. In granting the exemption, CAB chose the lesser of two evils. A firm attitude on the Dec. 1 deadline probably would have meant grounding scores of DC-6s and millions of dollars in lost revenues.

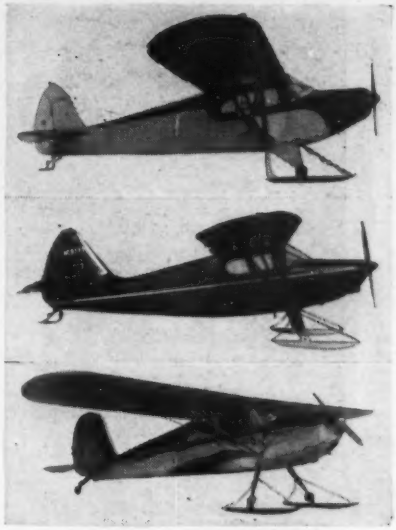
United's new third crew members are designated as "second officers." They occupy a seat behind and between the captain and first officer (see photo).

Nearly 120 UAL second officers have gone through a training course at a special company school in Cheyenne. The majority had airline copilot experience before entering the school. A hundred second officers were assigned to United's 39 DC-6s on Dec. 1, and the remainder will assume their duties by Dec. 15.

► **American's Training Course**—Sixty-four trainees were in the first flight engineer class started by American Airlines at Ardmore, Okla., Nov. 8. They will not graduate from the seven-week course until the end of this month. The first class is comprised entirely of AA and American Overseas Airlines employes, and it is likely that the full roster of 170 flight engineers will be selected from company personnel.

The majority of American's first class consists of pilots. But a large number are mechanics, nine of whom had flight engineer experience with AA's wartime Air Transport Command operation or with AOA. One trainee was a maintenance foreman and one was a senior engineer.

► **Curriculum Given**—Subjects to be cov-



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Increase Airplane Revenue

In winter, many new sources of income from Ski-plane operations are possible. Organized hunting, fishing, skiing, sleighing and other winter sporting events, will add new flying pleasure and stimulate enthusiasm for year around flying.

Increase Airplane Sales

Business concerns, farmers and ranchers can be interested in airplane ownership as a business necessity when shown that it is practical, economical, and safe summer and WINTER.

Go to businessmen in your community. Analyze their personnel travel requirements. Tell them how an airplane will economically, safely and conveniently handle transportation of personnel at low cost and minimum travel time.

Increase Airplane Rentals

Don't let snow stop winter flying operations. Equip your planes with skis and make winter flying hours turn in a profit.

Stimulate winter flying interest among students, pilots, sportsmen, businessmen, salesmen, field servicemen, etc. who do not own their airplane. Encourage, more charter trips for sales, service, emergency deliveries.

When heavy snowfalls stop other means of transportation, you can get there with airplanes equipped with Federal skis.

Increase Student Training

There are more good flying hours in winter, for airplanes equipped with skis than in summer for airplanes equipped with wheels. Encourage and promote student flying through the winter months, when other outdoor activities are minimized. Organize social groups among high schools, colleges and business concerns. Have them meet socially at the airport. By providing entertainment facilities, you can stimulate interest in winter flying. A few meetings and demonstrations of the fun of flying in the winter on skis will keep your planes flying profitably throughout the winter.

Increase Flying Safety

Federal Skis are low cost insurance. Almost any area large enough to land an airplane is a safe and satisfactory landing field in winter for ski equipped aircraft.

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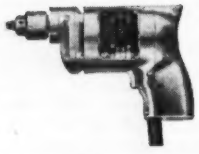
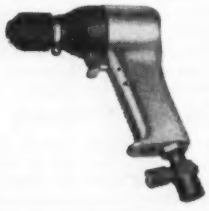


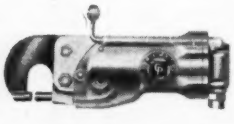


Construction of the first all-metal airplane presented the problem of driving thousands of rivets without undue work-hardening or injury to the surrounding metal.

CP engineers met the situation with the first airplane riveter — designed with controllable speed, and delivering just the right blow and exact impact.

Steadily maintaining its leadership over the years, CP today offers the world's largest line of pneumatic and electric air-frame tools. Ready for the heavy bomber program is the wide line of Pneumatic Impact Wrenches, including angle types, for running on or off nuts up to ½" bolt size.

Write for Air Tools Catalog No. 564, Ninth Edition.



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Rock Drills · Hydraulic Tools · Vacuum Pumps · Aviation Accessories

ered in the Ardmore school and time allotted are theory of flight and aerodynamics, 8 hr.; basic mathematics and physics, 11 hr.; weight and balance, 8 hr.; Civil Air Regulations, 6 hr.; DC-6 emergency procedures, 5 hr.; flight performance and "T" category, 7 hr.; basic power plants, 10 hr.; basic electricity and electrical devices, 8 hr.; DC-6 equipment, 150 hr.; DC-6 operating technique, 20 hr.; engine performance and cruise control, 10 hr.; and a review of engine theory and trouble-shooting technique, 10 hr. AA third crewmen will wear uniforms identical with those worn by pilots, except that they will have flight engineer wings and jacket sleeves with two full stripes.

Coincident with extension of the flight engineer deadline, CAA and CAB announced that a study of the factors involved in determining the size of crews for large transport aircraft will be made for the government agencies by the Flight Safety Foundation, New York. The preliminary study is to be completed within 60 days and will be followed by detailed analyses.

► **Research Program**—CAA and CAB will consider the results of the research prior to promulgating further regulations governing the crew requirements of transport planes. In calling for repeal of the flight engineer ruling last summer, American Airlines had argued that questions of crew complement are technical problems which should be decided only after scientific research by manufacturers, carriers and CAA. American said that pending a thorough investigation of (1) simplification of cockpit design; and (2) coordination between pilot and copilot, or between members of a multiple crew, CAB should not take the dangerous step of injecting a third crewman into a two-man cockpit such as that of the DC-6.

No Fall Slump In Overseas Traffic

Trans-Atlantic airlines apparently have licked the usual fall traffic slump this year.

Aided by the introduction of special 30-day excursion fares on Oct. 1, the carriers moved into December with highly-creditable load factors. American Overseas Airlines, first to report on November business, said it carried 1171 passengers to Europe during the month, an 84 percent gain over the same period last year.

► **Westbound Business Best**—AOA flew 3168 passengers westbound during November, up 38 percent over 1947. Load factors on the company's westbound planes averaged between 85 and 90 percent.

Harold R. Harris, AOA vice president

and general manager, said the recent east coast dock strike which tied up steamship travel for several weeks did not materially increase Europe-bound passenger traffic. He attributed the good fall business eastbound to both the excursion fares and the "growing preference of trans-Atlantic travelers for winter flying."

▶ **Steamship Passengers Stranded**—The maritime strike had an important bearing on westbound passenger loads for about three weeks. For a time, AOA's London office received requests for reservations at the rate of one a minute from U. S.-bound passengers stranded in England by the steamship tieup.

TWA also has done well on its overseas operations this fall. The company's international payload factor (passengers and cargo) rose from 56.9 percent in August to 60.2 percent in September, dropped slightly to 58.1 percent in October and bounced back to 62.5 percent during the first three weeks of November.

Pan American Airways reports its Atlantic division established new cargo records during October, with even greater volume indicated in November. Mail flown by PAA across the Atlantic also reached new peaks during November as the Post Office ordered the company, together with AOA and TWA, to start hauling surface mail backed up by the shipping strike.

Deliveries Scheduled On Stratocruisers

Northwest Airlines plans to take delivery on its first 75-passenger Boeing Stratocruiser in January or early February, and all ten of the $1,500,000 transports ordered by the carrier should be on hand by next fall.

After delivery of the first plane, NWA is slated to receive three more in March, one in April, one in June, one in July, two in August and one in September. Purchase of the Stratocruisers represents an investment of nearly $20,000,000 for Northwest, including the stockpiling of $4,500,000 in spare parts. The new double-decked planes are to be used on long domestic runs and on NWA's routes to the Orient and to Hawaii.

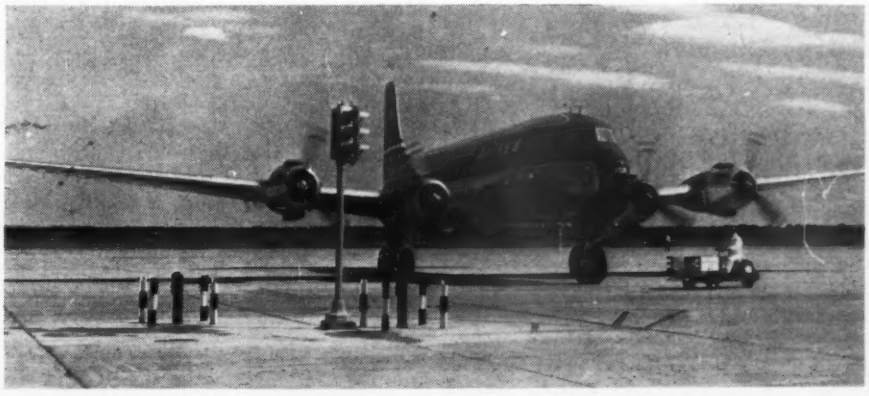
▶ **Flight Time to be Cut**—Stratocruisers should cut the flight time from Minneapolis-St. Paul to Tokyo to about 15 hr., the carrier believes. Pacific Northwest to Hawaii time is estimated at about 8½ hr., and passengers leaving New York at midnight may arrive in Seattle at 6:49 am.

Northwest has already begun preliminary crew training, and some company pilots have been checked out on the Stratocruiser. Intensified training will start as soon as the first plane is delivered.

▶ **First Plane to PAA**—Boeing is building 56 Stratocruisers. Pan American Airways, which has ordered 20 of the craft, expects to take delivery on the first plane within a few weeks. Other customers are Scandinavian Airlines System, American Overseas Airlines, United Air Lines and BOAC.

Virtually all performance guarantees of the Stratocruiser have been exceeded in the approved operating manual for the 71-ton plane, according to Wellwood E. Beall, Boeing vice president for engineering and sales. He said takeoff field length at the original guarantee gross weight of 135,000 lb. has been approved at 5380 ft., an improvement over original estimates.

▶ **Higher Maximum Weight**—Recently approved gross weight is 142,500 lb., 7500 lb. greater than the original guarantee, Beall stated. At the increased maximum gross of 142,500 lb., the required field length now is approved at 6250 ft.



AIRPORT TRAFFIC LIGHT

Stapleton Field, Denver, is using a highway stoplight to control ground traffic in the busy area between hangars 3 and 5, where there is a taxi strip, plane parking ramp and an airport automobile route. A watchman keeps his eye on plane and vehicle traffic.

Machinery manufacturers, tool and die makers, and metal fabricators depend upon Danly socket head cap screws to hold all types of components in assembled units. Positive locking action of these screws assures a precision fit and continuous rigidity of joined parts under all operating conditions.

Danly Socket Head Cap Screws Fill All Needs

Socket head cap screws, set screws, stripper bolts, flat head socket cap screws, hollow pipe plugs **and** ***hollow set screws*** **are available in various diameters and lengths as well as in different metals.**

Feature Advantages

★ **Hollow set screws have self-locking knurled points or self-locking knurled threads—will not shake loose.**

★ **All screws and bolts are manufactured to uniform standards of accuracy—assuring maximum dependability and service.**

★ **Screws are easily driven and easily removed.**

★ **Knurled head cap screws and stripper bolts will not slip in the fingers.**

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Die Springs—(1) medium pressure—high deflection, and (2) high pressure—medium deflection readily fit the requirements of all die work.

Dowel Pins—Hardened and ground to .0001"—are used for guiding and joining parts.

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Basic structure of the Stratocruiser has been tested and approved for an ultimate weight of 147,000 lb., according to the Boeing executive. "With constant development of the Pratt and Whitney Wasp Major engine both by the airlines and the military, its ratings will be increased, permitting Stratocruiser operation at higher gross weights. This indicates a need for continued airport development at major traffic centers."

Florida Wants Routes Granted Southern Airways

Florida Airways, which has been denied a renewal of its own certificate beyond next Mar. 28, wants to take over the 1300-mile feeder system which was granted to Southern Airways, Birmingham, Ala., in CAB's southeastern states area decision in April, 1947.

Southern has failed to inaugurate operations on its routes despite the lapse of more than 20 months, Florida told the Board. It asserted that the Birmingham company now has no organization to perform feeder service and lacks the resources to raise capital sufficient for such operations.

Florida said that as a going feederline it could activate and operate Southern's system at less cost to the public. Southern's routes are between Memphis and Charlotte, N. C.; between Columbus, Ga., and Charleston, S. C., and between Atlanta and Jacksonville. Florida Airways currently serves Jacksonville as one of its northern terminals.

CAB's action on Florida's petition will be watched closely by other feeders which have not activated their systems. These companies include Wiggins Airways, Norwood, Mass.; Parks Air Lines, East St. Louis, Ill.; Central Airlines, Oklahoma City, Okla.; Iowa Airplane Co., Des Moines; All American Aviation, Wilmington, Del.; Roscoe Turner Aeronautical Corp., Indianapolis, and Arizona Airways, Phoenix.

Latin America "Covered" By PAA Cargo Expansion

Pan American Airways is blanketing much of Latin America with an unprecedented expansion in cargo operations.

The carrier this month placed its entire fleet of 10 C-46s in cargo service between three southern U. S. gateways and South and Central America and the Caribbean. At the same time, PAA began twice-weekly DC-4 cargo flights between New York and Buenos Aires, serving principal ports enroute.

The C-46 Curtiss Commandos used by PAA are similar to dozens of others being leased by the Air Force to commercial carriers at $300 a month. From Miami the C-46s will make daily trips to Havana and five flights weekly to the Caribbean and the north coast of South America terminating at Caracas, Venezuela; Barranquilla, Colombia, and Panama.

Three PAA C-46 cargo flights will be made out of New Orleans each week to Guatemala City. Houston will have three weekly southbound flights to Mexico City, one continuing through to Guatemala City and Panama.

Numerous flag stops are listed on southbound trips. Return flights will operate on a more flexible basis to permit the C-46s to deviate from the regular route to pick up odd-lot cargoes. They will land at any airfield that can accommodate a C-46 and will be open to any shipper who wants to rush a special consignment to its designation on a nonscheduled basis.

SHORTLINES

► **Air America**—CAB has denied the nonscheduled operator's request for a temporary exemption authorizing it to engage in scheduled transportation of persons on a coach-type basis between San Francisco and New York (with a maximum of 18 DC-4 roundtrips or 6 million revenue passenger miles monthly); between Kansas City and Newark (unlimited service); between New York and Miami (with a maximum of 18 roundtrips or 2½ million passenger miles monthly) and between Newark and Atlanta, Ga. The large irregular carrier, which now flies coast-to-coast at coach rates, also was turned down by the Board on a request for liberalization of flight frequencies permitted by the nonscheduled exemption.

► **American**—Reports record passenger traffic out of New York on Thanksgiving eve, when it handled 3127 persons. Previous high on Thanksgiving eve was 2911 in 1946. AA's all-time high for outbound New York passengers was 3612 last July 2.

► **Air France**—Plans to inaugurate Constellation service between Paris and Caracas, Venezuela, via New York and Puerto Rico next month.

► **Capital**—Had an operating loss of $93,292 and net loss of $148,000 in October, although passenger traffic and revenue was up over Septen.ber. The operating deficit was the first in six months and was attributed in large measure to wage increases effective Oct. 1 and made retroactive to June 1.

► **CAB**—Robert J. G. McClurkin has become director of the Bureau of Eco-

nomic Regulation, replacing Russell B. Adams, who became a member of the Board on May 13. McClurkin has been assistant director (international) of the Bureau since 1946.

▶ **KLM**—Has extended its South American service from Montevideo to Buenos Aires following the recent conclusion of an air agreement between Argentina and the Netherlands.

▶ **Mid-Continent**—Reports $17,484 net profit in October, compared to $27,687 in the same month last year. Loss for the first ten months of this year has been pared to $548.

▶ **Pan American**—Has placed Convair-Liners on its route from Miami to Guatamala City via Havana, Cuba, and Merida, Mexico. . . . PAA has obtained CAB authorization to serve Basra, Iraq, for one year or until airport facilities at Baghdad are adequate. . . . Company has placed Constellations on its New York-San Juan-Curacao-Caracas run.

▶ **Transocean**—Has given nearly 1000 mechanics and helpers a 10 to 20 cents an hour raise.

▶ **United**—Has signed an interline cargo agreement with BOAC.

CAB SCHEDULE

Dec. 13—Hearing in Seattle on Board's investigation of large irregular carriers. (Docket 3450.)

Dec. 13—Hearing on Pan American Airways' Guatemala City-Los Angeles/San Francisco route case. (Docket 3277.)

Dec. 16—Oral argument on foreign air carrier permit application of Servicos Aereos Cruzeiro do Sul. (Docket 3336.)

Jan. 4—Hearing in TWA route consolidation case. (Docket 2581 et al.)

Jan. 10—Oral argument in Continental Air Lines route consolidation case. (Docket 576 et al.)

Jan. 10—Hearing on TWA's complaint against Seaboard & Western Airlines. (Docket 3346.)

Jan. 10—Hearing on TWA's complaint against Pan American Airways' Saudi Arabian service. (Docket 3264.)

Jan. 15—Hearing on Board's investigation of through service and interchange requirements at St. Louis and Memphis. (Docket 3426.)

Jan. 17—Hearing in Capital Airlines' New York-Chicago nonstop case. (Dockets 1789, 1790 and 3469.)

Jan. 23—Hearing on Board's enforcement proceeding against Transocean Air Lines. (Docket 3244.)

Jan. 24—Hearing on Board's Investigation of National Airlines route transfer. (Docket 3500.)

Jan. 25—Hearing on Western Air-Lines-Arizona Airways San Diego-Yuma route transfer. (Docket 3440.)

Jan. 31—Hearing on additional service to Puerto Rico. (Docket 2133 et al.)

Jan. 31—Hearing on Board's enforcement action against Nats Air Transportation Service. (Docket 3456.)

Feb. 2—Hearing on Florida trunkline service. (Docket 2215 et al.)

Feb. 16—Hearing in reopened Mississippi Valley and southeastern states cases. (Dockets 548 and 501 et al.)

Mar. 7—Hearing in southern transcontinental route case. (Docket 1102 et al.)

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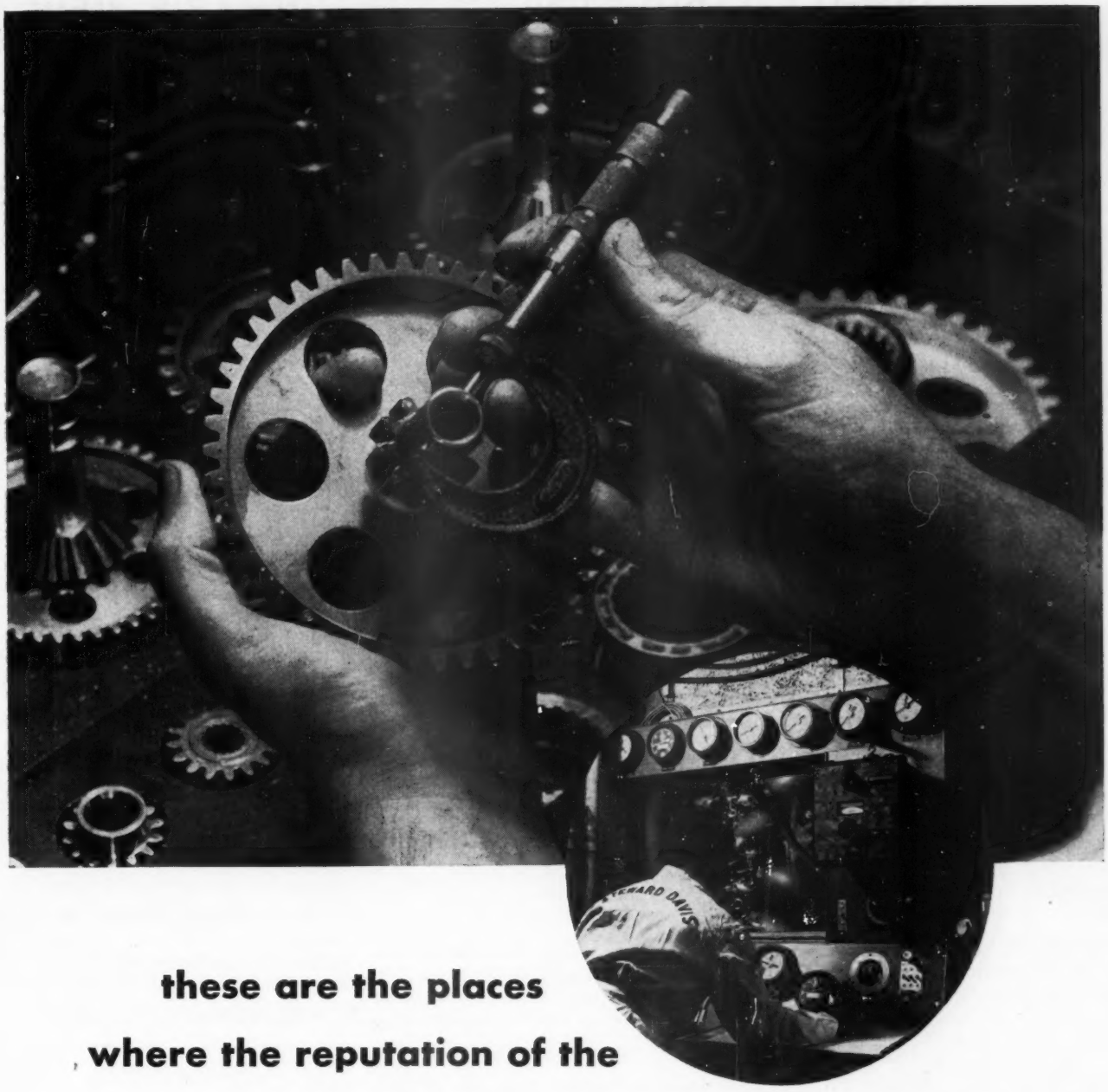

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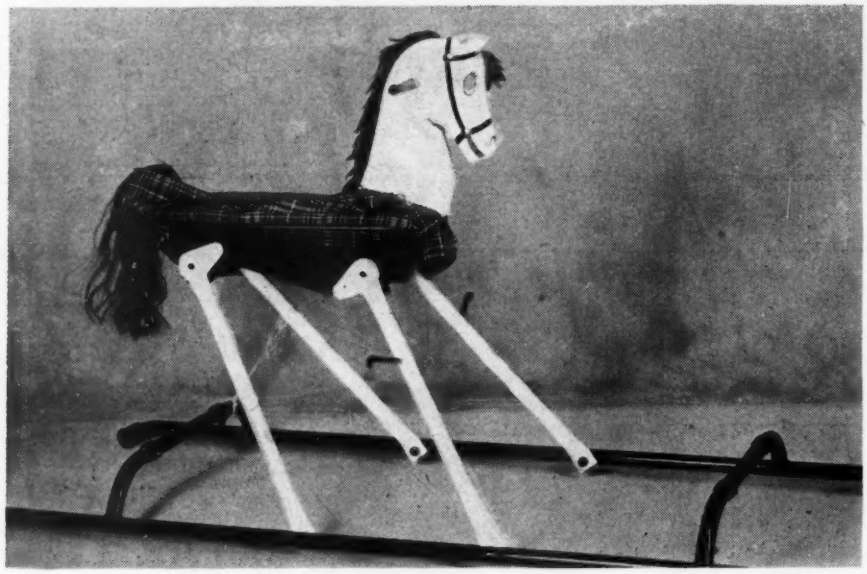

PICTURE OF THE WEEK

This is Jumper. Who is Jumper? He is a brand new hobby horse with lots of action. Why is Jumper's picture in Aviation Week? Because Jumper is a new product of Sensenich Corp., manufacturers of propellers. Jumper is the reason friends are calling Dick Bomberger "Cowboy Dick." Dick is Sensenich vice president-sales, and new president of Aviation Distributors & Manufacturers Assn. Jumper is a spring-action, aircraft-tubing Horse, designed for small-fry 2 to 8. He lists at $24.95 flyaway Lancaster, Pa. Company plans experimental production of 500 to 750 units for 1948 Christmas season. P.S. Alex McSurely says Sensenich still makes props.

* * *

THAT WASN'T WHERE HE CAME IN—Folks at Beech and Ryan doubt it could happen but **Bill Strohmeier** reports: **Frank Garofolo,** the used plane king at Teterboro, flies so many ships he gets confused sometimes. The other day he called, "Teter Tower, this is Navion 784 in the pattern." The tower saw a Bonanza on final approach and told the Navion to "pick up and go around." This happened three times before Garofolo realized he was in a Bonanza.

* * *

SADIE FEARS THE FUTURE—While Capt. **Hiram Wilson Sheridan,** known as Hy, was making one of those routine check trips aft in his DC-6 the other day, Sadie the Stewardess looked up from her paper and announced if all the airliners are going to run with jets she's going to quit, because she couldn't stand to hear an airline pilot confess "My fire is out."

* * *

NEW LOAD FOR JET FIGHTERS—Robert McLarren, AVIATION WEEK's engineer in Washington, passes along the story that's being told by Robert Woods, engineering consultant to Bell Aircraft, and Brig. Gen. Don Putt, USAF's research chief. Two aircraft contractors met at Wright Field and one said, "I just signed a honey of a contract for a new jet bomber." The other: "Really! How much will it carry?" and the answer was, "Exactly 65 percent of the undistributed overhead, that's all." (Note—McLarren denies this story was invented in reciprocating engine circles).

* * *

MORE SUPERSONICS—John Thompson of ATA confesses to the Aviation Writers Assn. newsletter he is still jibbering over a radio program the other night telling of Air Force progress. Main characters in the gripping drama were Max Westlake and Bill Karant.

"I really thought it was coincidence until the plot unfolded. Story was about a pilot who flew so fast—12 times speed of sound— that he crash-landed away back when he was a sergeant. Then I knew **Bill Westlake** and **Max Karant** had written it."

Still speaking of supersonics, **Bob Helmer,** TWA public relations manager, quotes a story told at a TWA Management Club meeting by Warren Lee Pierson, TWA board chairman. "Two elderly ladies had just boarded a TWA Constellation. One buttonholed the captain and said, 'Now, Young Man, none of this flying faster than sound. Minnie and I want to talk.'" Frankly, we saw this under a magazine cartoon recently. Shall we credit Pierson or the Satevepost? R. H. W.

WHAT'S NEW

New Books

"Man's Fight to Fly," by John P. V. Heinmuller, president Longines-Wittnauer Watch Co. Intimate stories and photos of the 16 most outstanding world record flights. Published by Aero Print Co., N. Y., $2.50.

"Fowler Flaps for Planes," an engineering handbook on flap designs, by Harlan D. Fowler. Published by Wetzel Publishing Co., Inc., 524 S. Spring St., Los Angeles 13. Price $5.

"Jane's All the World's Aircraft 1948," compiled and edited by Leonard Bridgmen. Published by Macmillan Co., 60 Fifth Ave., N. Y. Price $20.

Trade Literature

"Catalogue of Northrop Aeronautical Institute," description of the school's facilities and courses. 32-page, illustrated, available upon request to Northrop Aeronautical Institute, Hawthorne, California.

"Markets for Airborne Seafoods," a Wayne University Study in Air Transport (No. 5 in a series), by Spencer A. Larsen, William Reitz and Katherine K. Burgum. Available from Wayne University Press, 474 W. Warren, Detroit 2, Mich.

"U. S. Aircraft Motors," an 8-page booklet describing high frequency induction type motors, available from U. S. Electrical Motors, Inc., Milford, Conn.

"Make Ceilings Pay Dividends," a 28-page illustrated booklet on Link-Belt Overhead trolley conveyors. Available from Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.

"Analytical Instruments for Science and Industry," a 15-page catalog available from Consolidated Engineering Corp., 620 North Lake Ave., Pasadena, Calif.

Books In Preparation

McGraw-Hill Publishing Co., 330 W. 42nd St., New York; "Theory of Wing Sections," by Ira Abbott and A. E. von Doenhoff; "Gas Turbines for Aircraft," by Frank Godsey and Lloyd Young; "Airline Traffic Procedures," by Gene Kropf; "Aircraft Maintenance and Repair," by Northrop Aeronautical Institute; "Aviation Mechanic's Aircraft Manual," by John W. Vale, Jr.; "Air Transportation and Traffic Management," by Thomas Wolfe.

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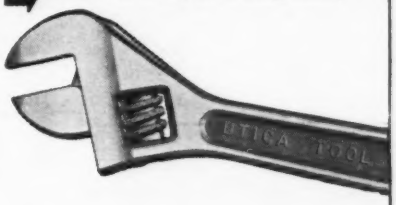

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EDITORIAL

Individualism Can Be Too Rugged

It is difficult to see how much longer the individualistic members of the Air Transport Assn. can afford to go their separate ways ignoring so many opportunities for joint economies.

The singular lack of standardization was brought home recently to a group of traveling newsmen in tours through the Convair and Boeing plants. Of course, transport manufacturers have waxed eloquently on the subject for years and are able to relate scores of individual changes each carrier demands.

Some, of course, are important and necessary. But when thousands of dollars are spent in labor and materials for such special items as different models of ash trays—or putting passenger doors on the left instead of the right—one decides those professional cost-cutters employed by the lines have not moved far enough from their office desks.

Floyd Odlum, chairman of the board of Convair, said the other day in San Diego that to date an average of $75,000 per Convair sold has been spent by the individual airline customers on their own peculiar modifications. Boeing officials told of even higher costs for the bigger Stratocruiser.

Another higher, hidden cost of such modifications is in the time lost to the airline in obtaining delivery.

Mr. Odlum's plan—or a similar idea—for financing transports off the shelf for a fixed price is a big step in the right direction.

Certainly, the next six months or year must see the biggest cost slashing program in the history of the nation's airlines—especially among the largest carriers. It will be fortunate, indeed, if one or two companies are spared serious financial difficulties in the first half of 1949.

The ATA has a golden opportunity to work together for economy but so far there is insufficient evidence to indicate top management realizes it. Frankly, we prefer to see management running the airlines, instead of the bankers.

Wichita—Bright Spot in Aviation

A tour of every major aircraft plant west of St. Louis reveals that Wichita is the brightest city in the industry.

In no other aircraft center are all of the manufacturers so busy, or so healthy financially. Wichita is proud of productivity and quality of its labor, as it has a right to be. And there are no labor shortages as yet.

Each of the three major companies enjoys intelligent and efficient management that exercises ingenuity and enterprise. Optimism is apparent everywhere.

In sheer backlog and plant space Boeing's two plants under Earl Sheafer, vice president, lead the city. As pointed out in AVIATION WEEK Nov. 22, big programs are the B-29 modification line, winterization of B-50s, production of assemblies for four big Boeing models, as well as spare parts and bomb dollies. The B-47 line is being prepared. Last March, Plant 2 was occupied by sparrows. Today, in a miraculous transformation, it is filled with B-29s and B-50s. In addition to its goal of 15,000 employes in Wichita, Boeing subcontracting will benefit companies from Omaha to Ft. Worth.

At Beech, too, the tempo is quick. Pessimism is kept non-existent by enthusiasm. Production and Navy modifications already outlined in AVIATION WEEK's Nov. 22 story are being supplemented by several experimental projects including the new Twin Quad transport and the Bonanza with two Franklins under its hood instead of one. General Manager Jack Gaty has another idea that may hit the headlines before long, which would greatly increase the range of liaison aircraft and make them more appealing to military planners. Beech has built over 127 twin-engined planes and 277 Bonanzas since the war. They are flying in 32 other countries besides the U.S.

Cessna's President Dwane Wallace and Don Flower, sales manager, surprised the visiting writers with their strong faith in the personal aircraft future, but feel there is a tremendous selling job that must be done by themselves as well as the industry.

Flower is convinced that personal or executive aircraft sales will rise as airline passengers increase, on the theory that those who are sold on commercial air travel will be quickest to see the advantages of operating their own executive planes. In an industry that tried and failed in impromptu non-aviation work immediately after the war, Cessna succeeds with two profitable side lines. It is producing hydraulic parts for farm implements for John Deere, J. I. Case and Moline, and it is turning out hundreds of tropicalized aluminum and wood chairs, bureaus, tables and other furniture for the Quartermaster Corps. Aircraft production will continue throughout the winter.

No one is singing the blues in Wichita.

ROBERT H. WOOD

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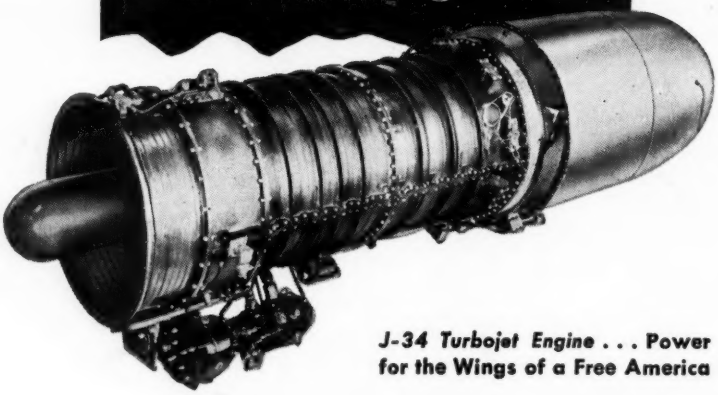

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